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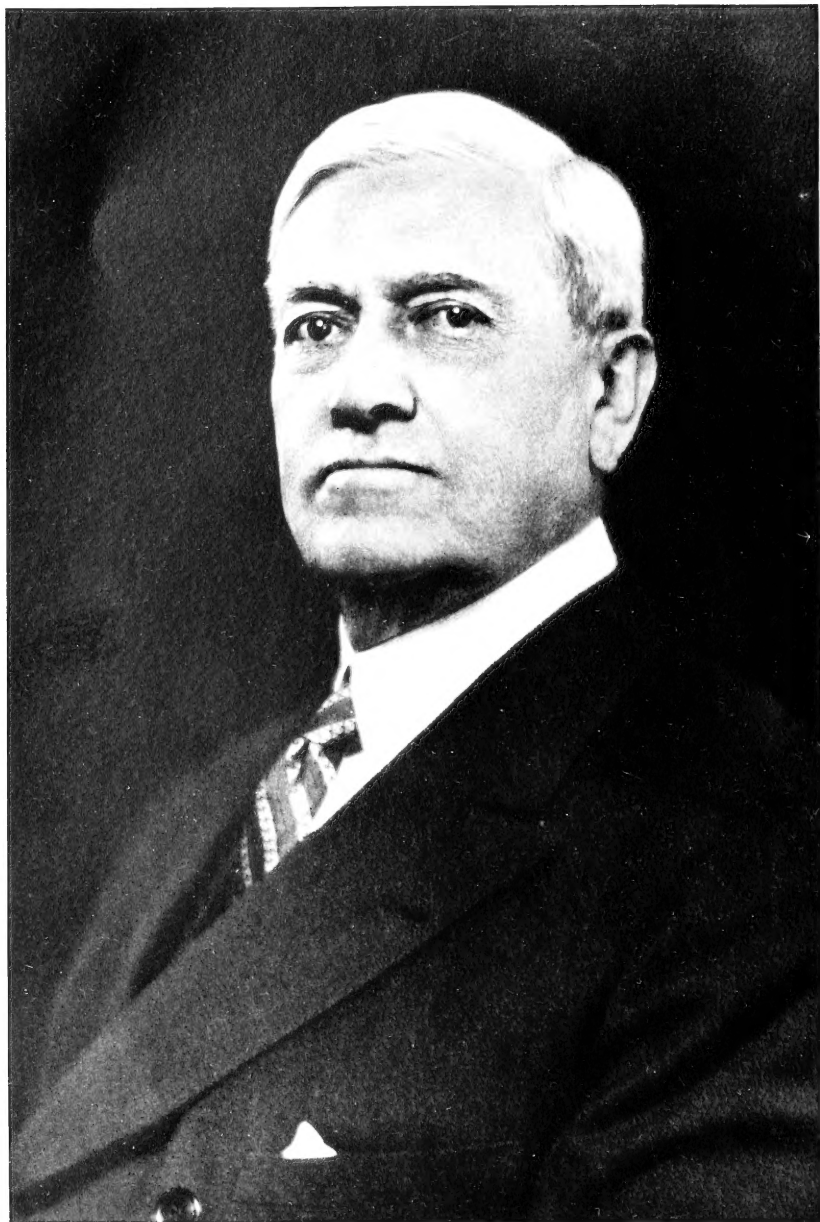
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Expedition to Eastern Asia of 1928-29

FIELD MUSEUM OF NATURAL HISTORY

FOUNDED BY MARSHALL FIELD, 1893

PUBLICATION 306

REPORT SERIES

VOL. IX, No. 1

ANNUAL REPORT OF THE DIRECTOR

TO THE

BOARD OF TRUSTEES

FOR THE YEAR 1931

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CHICAGO, U. S. A.

JANUARY, 1932

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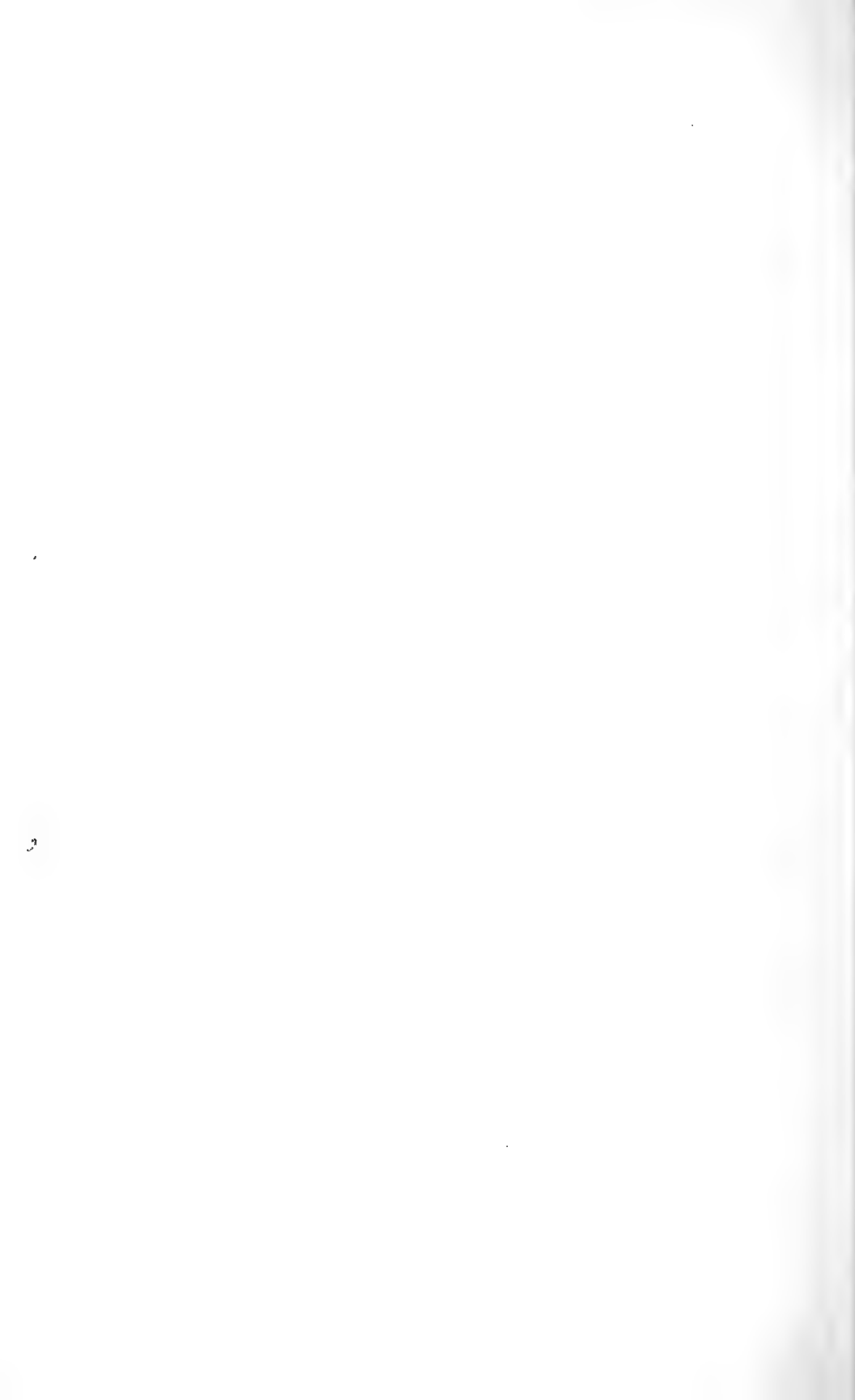
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ANNUAL REPORT OF THE DIRECTOR

1931

To the Trustees of Field Museum of Natural History:

I have the honor to present a report of the operations of the Museum for the year ending December 31, 1931.

The most impressive and gratifying fact about the year just closed is that the increase in attendance which has been noted annually for several years continued, bringing the total number of visitors for the twelve months to 1,515,540, a number exceeding by far any previous record in the history of the institution. This was the fifth consecutive year in which the number of visitors exceeded one million. The increase over the 1930 total of 1,332,799 is 182,741, or approximately 13.5 per cent, and compares with a gain of 164,369 made in 1930 over the preceding year.

While the total attendance increased so notably, the paid admissions decreased from 160,924 in 1930 to 126,209 in 1931, a development which undoubtedly may be largely attributed to the depressed economic conditions which have prevailed during the past year. The attendance on free days totaled 1,302,508, while the free admissions on pay days due to the special privileges granted Members, children, teachers, students, etc., numbered 86,823. Thus the total of free admissions in 1931 was 1,389,331, or considerably more than the total of free and paid admissions together in 1930. It is estimated that more than one-third of the total number of visitors were children.

The highest attendance for any single day during 1931 was on May 21, when 51,917 visitors were received. This vast number of people came to the Museum as a result of the fact that Grant Park was thronged that day with spectators viewing the United States Army Air Corps parade on the lake front. This attendance was exceeded on only two previous days in the Museum's history—June 20, 1926, when 54,024 visitors were received, and May 24, 1929, when the number of visitors was 59,843. On both of these occasions also there were special attractions in Grant Park which drew large crowds.

A second unusually large day during 1931 was Sunday, September 6, when 30,068 persons visited the Museum, and in a sense this attendance is even more gratifying than those of the other big days, because there were no special events drawing the people to Grant Park on this day.

In addition to the visitors received at the Museum, several hundred thousand children have been reached by the institution's educational influence as extended in extra-mural work carried on in the public schools and elsewhere by two units of the Museum organization. These are the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures which, in addition to providing programs and tours at the Museum itself for 76,342, reached 227,351 school pupils through lecturers sent out to address them in their class rooms and assembly halls; and the Department of the N. W. Harris Public School Extension, which, by means of traveling exhibition cases displayed in all the public and many other schools, with changes of subjects every two weeks, reached approximately 500,000 children over and over again during the school year. Thus, including both the general attendance (i.e., adults as well as children) at the Museum, and the children reached by the institution's outside activities, the Museum's educational influence reached directly more than 2,240,000 individuals.

It should be considered further that by various other means, such as the circulation of the publications of the Museum, reports in the newspapers, radio broadcasting, motion picture newsreels, etc., there is reached a still wider public on the number of which no calculation is possible, but which without question is of very large extent, running into millions.

The second day of May in 1931 marked the tenth anniversary of the occupation of the Museum's present building. The foresight in choosing the present site, which is almost equally convenient from all sides of the city, has been proved during this time by the attendance figures. During the more than twenty-five years of occupancy of the old Jackson Park building the total number of visitors to the Museum was 5,839,579, while in the ten years from the opening of the new building on May 2, 1921, to May 1, 1931, the total was 8,597,409.

At the request of the committee in charge of the Chicago Jubilee held May 11-20, Field Museum participated by remaining open in the evening from 6 P.M. to 10 P.M. on May 12. Although the day was one when admission normally is charged, during the evening hours the public was admitted free. There were 452 visitors during these hours.

The name of Mrs. E. Marshall Field was added in 1931 to the list of the Museum's Benefactors, as a result of her continued generous gifts to the institution, now totaling \$100,000.



THE LATE RICHARD T. CRANE, JR.

A Trustee of the Museum from 1908 to 1912 and from 1921 until his death on November 7, 1931

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In recognition of his services to the Museum as Director of the Field Museum-Oxford University Joint Expedition to Mesopotamia (Kish), and the fruitful researches he has conducted in connection with this work, Professor Stephen Langdon of Oxford University was elected a Corresponding Member of the Museum. Dr. Ludwig Diels, Director of the Botanical Garden and Museum of Berlin-Dahlem, was also elected a Corresponding Member in recognition of the noteworthy cooperation he has extended to Field Museum in the work of the Department of Botany, especially in its activities abroad conducted under the provisions of the Rockefeller Foundation fund for obtaining photographs of type specimens of plants.

Five names were added to the list of Contributors to the Museum. Mr. Frank P. Hixon became a Contributor as a result of gifts totaling \$1,000 in cash; Dr. Robert Van Valzah through a gift of \$1,000 in cash; R. Bensabott, Inc., as a result of gifts of material valued at \$1,200; Mr. Charles E. Raymond as a result of a gift of material valued at \$1,000; and Mr. Alfred T. Martin through a bequest of \$1,000 in cash.

The following persons were elected in 1931 as Life Members of the Museum: Mr. Max Epstein, Mr. Walter S. Carr, Mr. Scott S. Durand, and Mr. Newton Camp Farr.

Mr. Harold J. Coolidge, Jr., of Cambridge, Massachusetts, and Mr. W. C. Stephens of Chula Vista, California, were elected Non-Resident Life Members.

A list of Members in all classes will be found at the end of this Report (p. 226).

It is with deepest regret that there must be recorded here the death of Mr. Richard T. Crane, Jr., who had rendered the Museum incalculable services both as a Trustee and as a Benefactor. Mr. Crane had not only given unsparingly of his time and efforts to the work of the Museum, but he was also the donor of gifts to the institution totaling more than \$100,000 in value. In addition to being a Trustee and Benefactor, he was an Honorary Member, a Corporate Member, and a Life Member. What Mr. Crane stood for, and what he represented to the Museum, is expressed in the following resolution in tribute to his memory, adopted by his fellow Trustees on November 16:

"With profound sorrow and a keenly felt sense of great loss, the Board of Trustees of Field Museum of Natural History records the death, on November 7, 1931, of Richard T. Crane, Jr., long one of the most active of its members. Great homage is due this man who

in the fifty-eight years of his life had become an outstanding leader in both industrial and civic affairs. Endowed with capacities which made him a brilliant success, he was well-known also for his sympathetic interest in the welfare of all who were engaged in the enterprises he directed, and for his contributions to the welfare of the community as a whole. There was a charm, a gentleness, and simplicity about him, and a complete lack of affectation, which endeared him to all with whom he came in contact. The deepest loyalty was another quality with which he was imbued, and this was constantly manifest in his services to Field Museum, as in his other activities.

"Mr. Crane served as a Trustee of Field Museum during two periods: from 1908 to 1912, and again from 1921 until his death. His fellow members of the Board had a high regard for his counsel, and he was ever ready to give freely of his time and energy to assist in the best solution of all problems presented before the Board. That the Museum was at all times close to his heart is evidenced not only by his labors for it, but by his many generous gifts to the institution, in consequence of which his name will be perpetuated among the Benefactors of the Museum. He had also been elected an Honorary Member of the Museum, in recognition of other eminent services.

"Therefore, be it resolved that this expression of our admiration and esteem for Mr. Crane, and our grief at his passing from our midst, be permanently preserved on the records of the Board.

"And be it further resolved that our deep sympathy be conveyed to the members of his family in their bereavement, and that a copy of this resolution be sent to his widow."

Because of business demands upon his time, Mr. William Wrigley, Jr., resigned from the Board of Trustees at the close of the year. He continued his connection with the Museum, however, as a Corporate Member and a Life Member.

At the meeting of the Board on December 21, Mr. John P. Wilson and Mr. Sewell L. Avery were placed in nomination to fill the vacancies caused by the death of Trustee Crane and the resignation of Trustee Wrigley. Final action on these nominations was scheduled for the Annual Meeting and election to be held on January 18, 1932.

There were completed during 1931 a great number of new exhibits, some of which rank among the most important in the institution. In addition, noteworthy progress was made with the reinstallation of older exhibits in many halls. These new and reinstalled exhibits,

which reached a total of 237, are reported upon in detail under the heading INSTALLATIONS AND REARRANGEMENTS (p. 143). A general idea of their scope may be obtained from the following brief notes:

The most unusual and imposing new exhibit is the restoration of a scene in a swamp forest of the Coal age, some 250,000,000 years ago, vividly represented in all its luxuriance, and in natural size. This was installed in Ernest R. Graham Hall (Hall 38). This group (see Plates IV, V, IX, and XIII), twenty-eight feet wide, fifteen feet deep, and nineteen feet high, probably represents the first serious effort to reconstruct in three-dimensional form a whole assemblage of plants of Carboniferous time. A vast amount of intensive research, and three years of exacting labor in the Stanley Field Plant Reproduction Laboratories of the Museum, were necessary to produce this group. The exhibit was planned, and its construction supervised, by Dr. B. E. Dahlgren, Acting Curator of Botany.

Another striking new installation in Graham Hall is a life size restoration of titanotheres—gigantic extinct animals of North America which resembled rhinoceroses in general appearance, but were almost as tall as elephants (see Plate X). The group consists of an adult male and female, and one young titanotheres. It is the work of Mr. Frederick A. Blaschke, sculptor of Cold Spring-on-Hudson, New York, and results from the generous fund for groups and mural paintings in this hall provided by Mr. Ernest R. Graham.

The new hall of Chinese jades (Hall 30) was opened during the year. This hall contains one of the world's finest and most comprehensive collections of jade objects, ranging from the archaic periods down to the end of the eighteenth century. There are more than 1,200 pieces, carved in a great variety of forms, in the exhibit, and they have an aggregate value of several hundred thousand dollars. The collection is annotated with informative labels prepared by Dr. Berthold Laufer, Curator of Anthropology, and one of the most eminent authorities on the subject. The foundation of this collection was laid by the Blackstone Expedition to China, 1908-10, under the leadership of Curator Laufer. Many additions were made during a subsequent expedition in 1923, known as the Marshall Field Expedition to China, also led by Dr. Laufer. In 1927 the Bahr collection of Chinese jades was acquired by the Museum with a fund contributed jointly by Mrs. George T. Smith, Mrs. John J. Borland, Miss Kate S. Buckingham, and Messrs. Martin A. Ryerson, Julius Rosenwald, Otto C. Doering, and Martin C. Schwab. Other objects were presented by individuals and corpora-

tions, chiefly Mr. John J. Abbott, American Friends of China, R. Bensabott, Inc., Mr. Richard T. Crane, Jr. (deceased), Dr. I. W. Drummond, Mr. Fritz von Frantzius (deceased), Mr. Charles B. Goodspeed, Mr. H. N. Higinbotham (deceased), Mr. Linus Long, Mr. J. A. L. Moeller, Mrs. William H. Moore, and Mrs. George T. Smith.

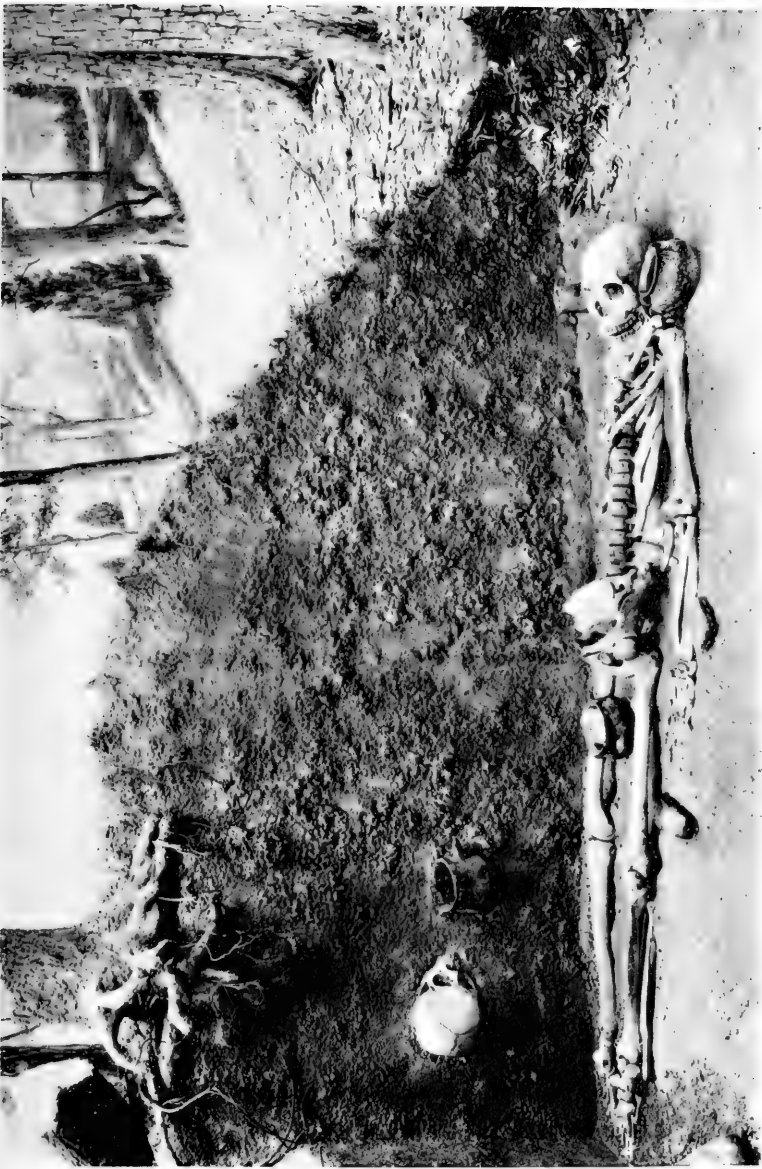
A full size reproduction of a grave of the prehistoric mound-builders of Illinois (see Plate III), with an actual skeleton and various artifacts brought from the original mound near Lewistown in Fulton County, was installed in Mary D. Sturges Hall (Hall 3). In the exhibit the mound is shown with the earth partly cut away so as to reveal its interior with the skeleton and artifacts exposed.

Four fine new groups of animals were added to the series in the Hall of American Mammal Habitat Groups (Hall 16). These bring the total number of such groups to twenty-one, and only one more group remains to be installed to complete the hall. The groups installed during 1931 are one of South American guanacos; one of South American tapirs (see Plate VI); one of South American anteaters; and one of mountain lions, which are found in both North and South America. The specimens for the three South American groups were obtained by the Marshall Field South American Expeditions. They were the work of Taxidermist Julius Friesser, while the mountain lion group was prepared by Taxidermist L. L. Pray. Backgrounds for all four were painted by Staff Artist C. A. Corwin.

A reproduction in cellulose-acetate of a twenty-six foot reticulated python of the East Indies has been placed on exhibition in Albert W. Harris Hall (Hall 18). The reproduction (see Plate XV), which shows the reptile coiled around a clutch of eighty-two eggs, is the work of Taxidermist Leon L. Walters. The original specimen was secured in Sumatra by the Philip M. Chancellor-Field Museum Expedition to the South Pacific in 1929.

A collection of several hundred examples of Coptic textiles, and another of tombstones and memorial and votive stelae, were installed in the hall devoted to Egyptian archaeology (Hall J). All phases of textile making and decorative design of the Coptic period in Egypt (first centuries of the Christian era) are represented in the first of these exhibits, which is one of the two largest collections of its kind in the country. The tombstones and tablets represent various epochs from 2200 B.C. down to the Christian era.

A miniature of a village which shows the dwellings and illustrates the varied activities of the Menangkabau, a Malayan tribe



REPRODUCTION OF AN ILLINOIS MOUND-BUILDER'S GRAVE

Mary D. Sturges Hall (Hall 3)

Skeleton and paraphernalia presented by Dr. Don F. Dickson, Lewistown, Illinois

Modeling by John G. Prasuhn, Background by Charles A. Corwin

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of the Padang Highlands of Sumatra, was completed and placed on exhibition in Hall G (see Plate VIII). Modeler John G. Prasuhn prepared this exhibit in accordance with data collected by a Museum expedition of several years ago.

Skeletons of two South American ground sloths of the Pleistocene age (one to one and one-half million years ago), mounted in positions characteristic of their habits in life (see Plate XVIII), have been placed on exhibition in Ernest R. Graham Hall (Hall 38). The specimens were collected by the Marshall Field Paleontological Expedition which spent some months in Argentina and Bolivia several years ago.

Several excellent celluloid reproductions of unusual fishes were installed in Albert W. Harris Hall (Hall 18). Among these are the pelican flounder, winter flounder, frostfish, wolf herring, scorpion fish (see Plate XIX), and poison fish. The reproductions are the work of Taxidermist Arthur G. Rueckert.

In Hall 15, containing the systematic series of mammals, there was installed a new exhibit of monkeys from various parts of Africa, Asia, and the East Indies, including a number of specimens obtained by recent expeditions. Of unusual interest is an excellent specimen of the rare golden (or snub-nosed) monkey which was secured by Colonel Theodore Roosevelt and Mr. Kermit Roosevelt while leading the William V. Kelley-Roosevelts Expedition to Eastern Asia for Field Museum. The C. Suydam Cutting Expedition to Sikkim, the Harold White-John Coats African Expedition, the Field Museum-*Chicago Daily News* Abyssinian Expedition, and the Cornelius Crane Pacific Expedition all contributed specimens to this exhibit. The animals were prepared for exhibition by Taxidermist Rueckert.

A new exhibit in Hall 34 of the Department of Geology shows the eight principal gases which occur as elements in the atmosphere. The gases are in separate glass tubes, and are made visible by passing an electric current through them, thus producing the characteristic spectrum of each.

The exhibits of North American birds in Hall 21 were augmented by a case containing 145 specimens of a great variety of species, and one side of a screen of swans and geese (see Plate XI).

A splendid skull of the great woolly rhinoceros, *Coelodonta antiquitatis*, acquired by the Museum from the Royal Museum of Brussels, Belgium, was placed on exhibition in Ernest R. Graham Hall (Hall 38).

An exhibit of the principal materials used in basket making, and another of dyes and tannins, were added to the economic botany collections in Hall 28.

Four remarkable gold earrings from ancient Kish, obtained by the Field Museum-Oxford University Joint Expedition to Mesopotamia, were added to the exhibit of Kish antiquities in Stanley Field Hall.

A collection of two dozen planks representing the principal species of woods of economic importance which are obtained from the Amazon valley, was placed on exhibition in the Hall of Foreign Woods (Hall 27). These were collected by the Marshall Field Botanical Expedition to the Amazon.

An exhibit illustrating a quick method of testing minerals for radium as well as showing the relative radioactivity of different mineral species was arranged in Hall 34 by the Curator of Geology, Dr. Oliver C. Farrington. All the principal minerals which are used as commercial sources of radium are included.

Among the reinstallations or other changes made in the various exhibition halls of the Museum to bring about desired improvements which may be mentioned as especially noteworthy are those in Hall J devoted to Egyptian archaeology, where reinstallation work has been in progress several years and was completed in 1931; Hall 20, in which the eighteen habitat groups of birds were completely rearranged so as to display them to better advantage and make a much more attractive hall; Mary D. Sturges Hall (Hall 3), in which the North American archaeological exhibits were reinstalled and augmented by the addition of much important new material; Charles F. Mills-paugh Hall (Hall 26), in which the comprehensive reinstallation of the North American wood collections as planned several years ago by Professor Samuel J. Record of Yale University School of Forestry (who is also the Museum's Research Associate in Wood Technology) was nearly completed; the collection of models of Chinese pagodas, which was reinstalled and relabeled in the South Gallery; an exhibit of skeletons of carnivorous mammals, which was reinstalled on a light-colored screen, in accordance with a new and improved method of display, in Hall 19, devoted to osteology; James Nelson and Anna Louise Raymond Hall (Hall 4), in which three cases of Naskapi material were installed, and Hall 10, in which five cases of Northwest Coast Indian material were reinstalled; the case in Stanley Field Hall illustrating the evolution of the horse, to which was added a model of the race horse "Man o' War" and in which

general improvements were made; a case in Frederick J. V. Skiff Hall (Hall 37) devoted to ores, which was revised to afford an interesting comparison of the amount of iron obtained from quantities of iron ore on exhibition; and the reinstallation of forty-four other cases in Skiff Hall, and forty-one cases in Ernest R. Graham Hall (Hall 38). These are but a few of the many reinstallations made.

Structural work on eight large built-in cases for groups in the Hall of Prehistoric Man (Hall C), begun late in the year 1930, was completed in 1931.

As a result of the removal of many duplicate anthropological specimens from exhibition during the past few years, many standard cases have been made available for new exhibition material. It has also been possible to convert some of these cases into new or special types of cases more suitable for some kinds of installations. This procedure has resulted in a large saving in expenditures for additional cases, and it will be continued wherever practicable.

Including parties engaged in local field work in near-by collecting grounds, the Museum had sixteen expeditions in operation during 1931. In addition to these, the institution benefited by receiving a number of excellent zoological specimens as the result of a hunting trip in Persia, made by Mr. James E. Baum, Jr., of Lake Forest, Illinois.

In general, due to the financial situation existing during the year, and also to the necessity of slowing down field work in order to complete work on material accumulated by the unprecedented expeditionary activities of the several preceding years, most of the expeditions of 1931 were on a smaller scale than in the recent past. Of the sixteen expeditions, eleven were in foreign countries, three in the western United States, one close to Chicago, and one in Maine. Full details concerning the work performed and the personnel on all the expeditions will be found in the section of this Report under the heading EXPEDITIONS AND RESEARCH, beginning on page 62. Following is a brief summary of some of the most important operations:

The ninth season of excavations on the site of the ancient city of Kish by the Field Museum-Oxford University Joint Expedition to Mesopotamia was concluded during the early part of 1931, and toward the end of the year the tenth season, which carries on into 1932, was begun. As in previous years, Mr. Marshall Field generously provided the funds for Field Museum's participation in this expedition. Professor Stephen Langdon continued as director of

the expedition and conducted research upon the antiquities unearthed, while Mr. L. C. Watelin remained in charge of operations in the field. Adding to the remarkable accumulation of archaeological collections and historical data from its work of previous years, the expedition in 1931 discovered the first well-preserved palaces of the Sassanian dynasty (A.D. 226–636) of Persian kings ever found. The expedition also brought to light Sumerian royal tombs more than 5,500 years old, while in another section of the ruins it found jewelry which was probably worn at the court of Nebuchadnezzar some 2,500 years ago.

Mr. C. Suydam Cutting, of New York, organized and wholly financed an expedition to Sikkim, India, on behalf of the Museum's Department of Zoology. This was the fifth Museum expedition in which Mr. Cutting has participated. He personally led the big game hunting division of the expedition, and among the outstanding specimens in his collections were three of argali or Hodgson's sheep, a mountain animal very difficult to obtain. Mr. Herbert Stevens of Tring, England, accompanied Mr. Cutting, and remained in the field for further collecting after Mr. Cutting's return home. The expedition obtained rare animals found only in the highest parts of the Himalayas; a specimen of the rare Tibetan water shrew; an exceptionally fine series of monkeys; and large general collections totaling about 2,000 specimens, which included mammals, birds, reptiles, amphibians, and fishes. Many new and unusual species in the collection are of great value for scientific research.

The Carey-Ryan Expedition to Indo-China resulted in excellent specimens of the seladang (gaur ox or Indian bison) and of Indian water buffalo, which will be used in the series of Asiatic mammal habitat groups in William V. Kelley Hall. This expedition was financed by Mr. George F. Ryan of Lutherville, Maryland, who led it jointly with Mr. George G. Carey, Jr., of Baltimore.

As a result of an expedition to central Africa, financed and led by Captain Harold A. White of New York and Major John Coats of London, the Museum received five specimens of the bongo, one of the rarest and handsomest of all antelopes. A gift to the Museum of motion and still photographs of living bongos, the first ever made, also resulted from the activities of this expedition.

The Marshall Field Zoological Expedition to China, under the leadership of Mr. Floyd T. Smith of New York, continued work on its mission of making a comprehensive collection of the fauna of western and southern China.

The Third Marshall Field Archaeological Expedition to British Honduras conducted excavations on ancient Maya sites for several months. Collections of rare and curious objects, and many scientific data on both the ancient and modern Mayas, were brought back by Mr. J. Eric Thompson, Assistant Curator of Central and South American Archaeology, who was leader.

Valuable collections, and important discoveries which may change a number of archaeological concepts, were made by the Field Museum Archaeological Expedition to the Southwest in its second season of operations on the Lowry ruin in Colorado. The expedition was financed from funds provided by Mr. Julius Rosenwald and the late Augusta N. Rosenwald. Dr. Paul S. Martin, Assistant Curator of North American Archaeology, was the leader.

Toward the end of the year an expedition to French Indo-China, led by Mr. Jean Delacour, well-known French zoologist, departed from Paris to begin operations. Field Museum's participation is sponsored by Mr. William V. Kelley. The Museum will receive the bulk of the collections, the remainder going to the Paris Museum of Natural History and the British Museum (Natural History).

Still later in the year an expedition was organized and financed by Mr. Leon Mandel II of Chicago, to make zoological collections along the lower Orinoco River in Venezuela. Mr. Mandel sailed from Miami, Florida, on December 29, aboard his yacht *Buccaneer* with a small party including his brother, Mr. Frederick Mandel, and Mr. Emmet Blake, zoologist of the University of Pittsburgh engaged especially to collect for Field Museum.

An expedition to Nebraska, sponsored by Mr. Marshall Field, collected fossil mammals of Miocene age (19,000,000 to 23,000,000 years ago). It was under the leadership of Associate Curator of Paleontology Elmer S. Riggs, and the personnel included several members of the staff of the Department of Geology.

Miss Malvina Hoffman, the sculptor of international reputation who has been commissioned to prepare the life size bronze figures, busts and heads of types of the principal races of the world for the exhibits to be installed in Chauncey Keep Memorial Hall, was engaged in research work in Europe during the early part of the year, and in Hawaii, Japan and China during the later months. During her visits in these countries she modeled Hawaiian, Samoan, Japanese, Ainu, and Chinese types. She also collected necessary data which will be of use in completing certain of her sculptures in bronze. With her work in China finished at the end of the year, Miss Hoffman

left for the Philippine Islands, Bali, Java, Sumatra, the Andamans, and India, where she will do similar work. By such extended travels Miss Hoffman is enabled to select and model directly from life the best representative types of the various races, and her efforts are meeting with remarkable success. She has already completed a number of the figures even through the final stages of the work in bronze, and these have been acclaimed by both anthropologists and art critics—by the former for their scientific accuracy, and by the latter for their beauty. They represent probably the finest work of this eminent artist whose previous sculptures had already won her a high place in the world of art. It is appropriate here to express the Museum's appreciation of the courtesies and valuable assistance rendered to Miss Hoffman by anthropologists and government officials of the various countries she has visited. They have cooperated wholeheartedly in furnishing necessary data, and in helping her to obtain the services as models of natives who best illustrate the characteristics of the racial types she is depicting in her work.

Mr. J. Francis Macbride, Assistant Curator of Taxonomy, continued the work of obtaining photographs of type specimens of tropical plants of the Americas in European herbaria, in which he has been engaged since 1929. This is a project sponsored by the Rockefeller Foundation, and conducted by Field Museum, to provide botanists with a vast reference collection of such photographs, which are of tremendous importance to persons engaged in botanical research. To date more than 18,000 photographs have been assembled.

Through the good offices of Mr. Bruce Thorne, a vice-president of Alaska Guides, Inc., arrangements were made whereby that organization obtained for the Museum five specimens of caribou for a proposed group to be installed in Hall 16. This was made possible through the cooperation of the United States Biological Survey which had previously granted the Museum's request for a renewed permit for this purpose. The animals were obtained toward the end of the year in the Rainy Pass region of Alaska.

As a result of the Vernay-Lang Kalahari Expedition of 1930, the Museum received in 1931 a specimen of the rare giant sable antelope of Africa, in size extremely close to the record specimen ever taken by any hunters. The horns of the specimen are five feet two and one-half inches long, which is only one and one-half inches less than the record. This animal is found only in a limited area of Angola (Portuguese West Africa). As a result of the same

expedition the Museum will receive a large collection, including representatives of practically all the large mammals of South Africa, and several thousand specimens of small mammals, birds, reptiles, fishes, and invertebrates. The expedition was financed by Mr. Arthur S. Vernay of New York and London, and led by him jointly with Mr. Herbert Lang of Pretoria, South Africa.

Under a grant of \$3,000 made by Mr. William V. Kelley, which contribution was reported in 1930, arrangements were made with the Bombay Natural History Society, through Sir Reginald Spence, its honorary secretary, whereby the society will furnish its services in procuring accessory material, notes, photographs, etc., necessary for the construction of eight proposed habitat groups of Asiatic mammals in William V. Kelley Hall (Hall 17).

The general economic depression from which the world has been suffering has naturally had an effect upon the Museum finances. The difficulties thus presented have been met as far as possible by curtailing certain activities to some extent, and by effecting more than usual economies wherever it has been found practicable. The Museum's expeditions and field activities especially have been reduced in size and extent because of these conditions, and it is expected that this type of work will be kept at a minimum also during the ensuing year. It has been necessary also to cut down somewhat the working force of the Museum.

Although the total expenditures for the year 1931, amounting to \$841,740.85, were \$58,479.95 less than the expenditures in the year 1930, there was a deficit of \$7,211.39, which, added to notes payable on account of money borrowed for previous years' deficits, brought the notes payable at the close of the year to a total of \$184,800.

The Museum received various benefactions, both in money and material, for which expressions of gratitude are herewith renewed. Acknowledgments of gifts of funds follow:

Mr. Marshall Field contributed \$150,000 for use in meeting part of the operating expenses of the Museum during 1931.

President Stanley Field contributed a total of \$120,476.47. This amount represents four different contributions, distributed as follows: \$91,099.44, towards liquidation of the building fund deficit; \$1,000, which the Museum turned over as a gift to the International Office for the Protection of Nature, at Brussels, Belgium; \$16,177.03, to cover the operating expenses of the Stanley Field Plant Reproduction Laboratories of the Museum during 1931; and \$12,200, to

cover the cost of twenty-one less than life size and two larger than life size figures in bronze of various racial types of the world, made by the sculptor, Miss Malvina Hoffman. The bronzes are reproductions of some of the life size sculptures Miss Hoffman is making for Chauncey Keep Memorial Hall, and are not included in the contract for that work for which funds were provided by the late Mr. Chauncey Keep, Mr. Marshall Field, and Mrs. Charles H. Schweppe.

A gift of \$50,000 was received from Mrs. E. Marshall Field, representing her annual contribution.

Mrs. James Nelson Raymond made two contributions, one of \$2,500 and another of \$1,000, toward the operating expenses of the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures, which was established by her in 1925.

Mr. Frederick H. Rawson contributed \$5,000 for use in connection with the projected Hall of Prehistoric Man.

The Rockefeller Foundation made a further grant of \$5,000 for continuing the work of photographing type specimens of plants. This was the third and final payment in a series totaling \$15,000.

Contributions totaling \$3,252.30 were made by Mr. C. Suydam Cutting for payment of the salary and expenses of a collector employed in connection with the C. Suydam Cutting Expedition to Sikkim, India, conducted for Field Museum.

Dr. Robert Van Valzah contributed \$1,000 to the Field Museum-Oxford University Joint Expedition to Mesopotamia.

Contributions totaling \$750 were made by Mr. Henry J. Patten, also for use in connection with the Kish expedition.

From the American Friends of China, Chicago, the sum of \$625 was received for the purchase of material for addition to the Museum's Chinese collections.

Mr. Frank P. Hixon made a contribution of \$250.

Mr. Joseph Simons contributed \$250 towards the expense of sending Taxidermist Ashley Hine to southern California to make a collection of the birds of that region.

Mr. William J. Chalmers contributed \$67.75 for the purchase of additional specimens for the crystal collection.

The South Park Commissioners turned over to the Museum \$167,360.43, representing the amount due the Museum under the tax levy for this purpose authorized by the state legislature.

Many gifts of valuable material for the collections in the various Departments of the Museum have been received in 1931. Gifts of



DETAIL OF CARBONIFEROUS FOREST GROUP

Ernest R. Graham Hall (Hall 38)

A primitive conifer, *Cordailes*, a long extinct type of gymnosperm of the Pennsylvanian period, reconstructed in Stanley Field Plant Reproduction Laboratories, Department of Botany of the Museum

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this kind, continuing as they do year after year, are very gratifying not only because of the enrichment of the collections, but also because of the indication they give of a great and active interest which is being taken by friends of the Museum in the development and improvement of the institution. Details of the acquisitions of the year are given in the departmental sections of this Report under the heading *ACCESSIONS* (p. 104), and in the *LIST OF ACCESSIONS* beginning on page 190.

Special mention seems due here in regard to certain outstanding gifts of material:

With the delivery in 1931 of the five final canvases in the series of twenty-eight murals representing the life and scenery of pre-historic ages, presented by Mr. Ernest R. Graham, one of the largest and most remarkable gifts ever received by the Museum was completed. These paintings by Mr. Charles R. Knight, an artist who probably has no peer in his specialty of depicting animals of the past, are now to be seen on the walls of Ernest R. Graham Hall (Hall 38). They are of dimensions making possible the presentation of their subjects vividly and strikingly, one-half of them being twenty-five by nine feet in size, and the others eleven by nine. They have been much praised as works of art, but in addition, and more important from Field Museum's standpoint, they incorporate the most recent and accurate scientific knowledge of their subjects, as agreed upon by leading authorities.

Mr. and Mrs. Marshall Field gave the Museum four specimens of lions. These are the animals they shot during their African hunt in 1930 (*Annual Report of the Director for 1930*, p. 288), and the specimens are to be used in the preparation of a habitat group which has long been desired for addition to the Museum's African mammal exhibits. Mr. and Mrs. Field presented the Museum also with several thousand feet of excellent motion picture films which they made of life in the African wilds.

Shortly before he died, the late Mr. Richard T. Crane, Jr., presented to the Museum two remarkable and unusually valuable gem specimens. One of these is a flawless cut ruby topaz, weighing 97.55 carats. It is about one and one-quarter by seven-eighths inches in size, and is believed to be the finest example ever produced of rose or Brazilian ruby. The other stone is a plaque of black Australian opal weighing 148 carats, with a polished surface two by one and one-half inches, in which are blended tints of the rarest and most desirable type, which change according to the angle from which it

is inspected. Both of these gems have been added to the exhibits in Harlow N. Higinbotham Hall (Hall 31).

Two bricks of silver, historically as well as intrinsically valuable, were presented by Mr. William J. Chalmers. One of these was made in 1878 by the first water-jacket furnace at Leadville, Colorado, and the other was made from ore brought from some of the first silver mines operated in Montana. Mr. Chalmers also gave the Museum material for addition to the crystal collection, and a number of desirable mineral specimens.

Mr. Frederick Blaschke, the sculptor, of Cold Spring-on-Hudson, New York, was the donor of a beautiful model of "Man o' War," famous race horse, which he made from life. This has been added to the exhibit in Stanley Field Hall illustrating the evolution of the horse.

Among other gifts received for the collections of the Department of Geology are a series of very rare metal specimens presented by Mr. Herbert C. Walther of Chicago; a collection of Arkansas minerals given by Mr. Frank von Drasek of Cicero, Illinois; a collection of remarkable cave photographs contributed by Mr. Russell T. Neville of Kewanee, Illinois; a remarkable series of 301 fulgurites or "lightning tubes" received from Mr. E. A. Mueller of Chicago; and a fossil skull and jaw of the so-called four-tusked mastodon, *Trilophodon*, presented by Messrs. Roy Muhr of Redington, Nebraska, and Anton C. G. Kaempfer of Bridgeport, Nebraska.

An important gift was received from Dr. Don F. Dickson of Lewistown, Illinois, consisting of material from the Indian mounds which he has excavated in the vicinity of Lewistown. Included are a complete Indian skeleton, two skulls, and twenty-six specimens of pottery, flint implements and shell ornaments. This material was used in preparation of the exhibit of a mound-builder's grave (see Plate III).

Some valuable additions to the Chinese jade collection were made by the firm of R. Bensabott, Inc., of Chicago, which presented a beautifully decorated square green jade box, and by Mr. Linus Long, who gave two ceremonial jade axes.

Two specimens of red deer from Scotland were received from Viscount Furness of Invernesshire, Scotland.

Mr. James E. Baum, Jr., of Lake Forest, Illinois, presented six specimens of the Persian wild ass and two of Persian wild goat to the Museum. These specimens resulted from a recent hunting trip which he made in Persia.

Mr. Arthur S. Vernay of New York gave the Museum a valuable collection of ethnological material representing the Bushmen of Africa, who are probably the most primitive people in existence today. The objects in this collection were obtained by Mr. Vernay while he was leading the Vernay-Lang Kalahari Expedition for Field Museum in 1930.

Mr. C. Suydam Cutting of New York presented three specimens of the argali or Hodgson's sheep, a mountain animal which is very difficult to obtain. He secured these on his expedition to Sikkim, India, mentioned elsewhere.

Mr. and Mrs. Edward W. Everett of Hinsdale, Illinois, presented a rare Chinese painting, done on silk, of a school of carp. This is an exquisite example of Chinese art. It is thirty-two by sixty-six inches in dimensions.

President Stanley Field presented anthropological books valued at \$157 to the Museum Library.

Shortly before his death the late Mr. Robert H. Everard of Arusha, Africa (formerly of Detroit, Michigan) presented the Museum with a specimen of scaly anteater obtained in Tanganyika Territory, Africa.

Mr. A. A. Dunbar Brander of Elgin, Scotland, gave the Museum nineteen specimens of birds of the English countryside. Among other important gifts of zoological material are a collection of 345 salamanders of Tennessee received from Mr. D. C. Lowrie of the University of Chicago; 173 reptiles and amphibians of Texas from Dr. C. E. Burt of Winfield, Kansas; a Florida tarpon from Mr. C. Irving Wright of Pirates' Cove Fishing Camp, Florida; five Japanese toads from Dr. K. K. Chen of Indianapolis, Indiana; two cave salamanders from Dr. Karl Absolon of Brünn, Czechoslovakia; fifty Tennessee reptiles and amphibians from Mr. A. S. Windsor of Chicago; a giant snapping turtle from Mr. G. M. Stevens of Marcella, Arkansas; twenty-one frogs from Major Chapman Grant of San Juan, Porto Rico; and a specimen of capercaillie from Count Degenhard Wurmbrand of Vienna, Austria.

Among important contributions to the collections of the Department of Botany are eight boards of African and Mexican mahogany and teak given by Mr. T. R. Williams of New York; twenty veneered panels of foreign woods and ninety-six other foreign wood specimens presented jointly by J. H. Smith Veneers, Inc., and Schick-Johnson of Chicago; a board of ipil wood from Mr. Ralph A. Bond of Chicago; 8,925 negatives of type specimens of tropical American plants

in European herbaria obtained by Assistant Curator J. Francis Macbride under a grant of funds from the Rockefeller Foundation, New York; the trunk of a rubber tree presented by Mr. Paul Van Cleef and the Wilkinson Rubber Process Company of Chicago; twenty samples of tobacco from John H. Meyer and Son of Chicago; 353 specimens of plants from Alberta and Colorado given by the Department of Botany of the University of Chicago; twenty-eight specimens of fiber plants received from the Companhia Ford Industrial do Brasil, of Pará, Brazil; and 100 specimens of trees and shrubs of tropical America from the School of Forestry of Yale University.

The collections of the various Departments of the Museum were augmented also by accessions obtained through Museum expeditions, purchases, and through exchange with other institutions. Details of these will be found in the section of this Report devoted to ACCESSIONS (p. 104), and the LIST OF ACCESSIONS (p. 190).

Among the most notable of such acquisitions in the Department of Anthropology are the following: a collection of Eskimo archaeological material from the Bering Strait region, acquired by the Museum through an exchange with the United States National Museum at Washington, D.C.; a skeleton of a man who lived 7,000 to 10,000 years ago in what is now Hungary (this is the only practically complete human skeleton representing this period of neolithic culture which has reached the United States and is therefore of great scientific importance), acquired by purchase; a collection of flint implements approximately 1,000,000 years old, representing the earliest definitely determined handiwork of prehistoric man yet discovered anywhere in the world, obtained as a result of excavations conducted for the Museum near Ipswich, England, by Mr. J. Reid Moir of that locality; and an important collection of fifty-four specimens of ancient Brazilian pottery, probably dating back to about A.D. 1200, obtained through an exchange with the Museum of the University of Pennsylvania, Philadelphia.

The Department of Botany received 1,098 specimens of plants from Mexico and Sumatra by exchange with the Department of Botany of the University of Michigan, at Ann Arbor; and 1,336 herbarium specimens of plants chiefly from Brazil and Cuba, by exchange with the Naturhistoriska Riksmuseet, Stockholm, Sweden. A collection of 964 herbarium specimens of Paraguayan plants was purchased from Mr. Pedro Jorgensen, of Villarica, Paraguay.



CARBONIFEROUS FOREST GROUP

Ernest R. Graham Hall (Hall 38)

A scene of two hundred and fifty million years ago showing plant and animal life that furnished the material for the world's principal coal-beds. This exhibit, composed of reconstructions of extinct forms, was prepared in Stanley Field Plant Reproduction Laboratories, Department of Botany of the Museum

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Important accessions received by the Department of Geology by exchange included one complete skeleton each of extinct horse, bison, ground sloth and carnivore from the so-called "tar beds" of Los Angeles, California, received from the Los Angeles Museum of History, Science and Art; a complete and well-preserved skull and jaws of the woolly rhinoceros which ranged in Europe during the glacial period, from the Royal Natural History Museum at Brussels, Belgium; three species of Cambrian trilobites from the British Museum (Natural History), London; a specimen of the Olmedilla (Spain) meteorite from Mr. C. Wendler, Geneva, Switzerland; and an etched section of the Tacubaya (Mexico) meteorite from Professor H. H. Nininger of Denver. Specimens of two other meteorites from Brule, Nebraska, and Adams County, Colorado, were received partly by exchange and partly by purchase. There were also received by exchange from Mr. H. G. Clinton of Manhattan, Nevada, twenty-one specimens of rare aluminum phosphates and associated minerals; from Mr. Joseph Linneman of Buffalo, New York, thirteen specimens of various rare minerals; and from Mr. Joseph Bianchi of Paterson, New Jersey, a fine specimen of the newly described silicate, norbergite, with associated minerals. Important purchases included the complete fall of the Breece (New Mexico) meteorite, weighing 115 pounds; a representative specimen of the Newport (Arkansas) ironstone meteorite; two skulls and jaws, and other skeletal parts, of the rare fossil ungulate, *Protitanotherium*, giving the Museum the best representation known of this important genus; a head of the great fossil fish, *Portheus*; a horn, three and one-half feet in length, of the fossil bison, *Bison regius*, an extinct species remarkable for the great length of its horns; six specimens of beautifully preserved crinoids and starfish from Bundenbach, Germany; and a set of the eight principal gases of the atmosphere.

The Department of Zoology received 708 selected zoological specimens by various exchanges, mainly from the following institutions: British Museum (Natural History), London; Cincinnati Society of Natural History; Museum of Comparative Zoology, Cambridge, Massachusetts; New York University; and Senckenberg Museum, Frankfurt-on-the-Main.

Through a most gracious and generous act on the part of the Metropolitan Museum of Art, New York, ownership of a cut leather ceremonial corselet of a priest of ancient Thebes was assigned to Field Museum. This valuable archaeological specimen, which is one of the only two known examples of this kind of corselet in the

world, had been on exhibition in Field Museum's Egyptian collections for many years, as a permanent loan from Mr. Theodore M. Davis of Newport, Rhode Island. Mr. Davis died in 1931, leaving all of his Egyptian collections to the Metropolitan Museum, and there was a question as to whether he intended to include this corselet in the bequest or not. Agreement was made between the two museums to submit the question privately to Judge Julian Mack. Judge Mack made a thorough study of all data pertaining to the matter, and reported that in his opinion Field Museum had a proper claim to the corselet, whereupon the Metropolitan Museum accepted his decision and relinquished its claim.

Field Museum made a contribution of \$300, representing its annual payment, to the Institute for Research in Tropical America, located on Barro Colorado Island, Gatun Lake, Canal Zone, Panama.

The Museum turned over to the Century of Progress Exposition ten totem poles, one mortuary pole, one Haida Indian house, one Eskimo whalebone house, and three carved wooden figures. This material will be exhibited during the exposition in 1933.

Negotiations were instituted between the Consul-General of the republic of China at Chicago, Dr. Koliang Yih, and the Museum, which are expected to lead to the loan of the Chinese gateway, which the Museum formerly had on display in Stanley Field Hall, to the Chinese government for use in its exhibit at the Century of Progress Exposition. This gateway, a remarkable and artistic creation carved from teakwood, was an exhibit at the Panama-Pacific International Exposition in San Francisco, and was purchased by the Museum at the close of the exposition.

The work of all Departments and Divisions of the Museum showed satisfactory progress during the year. Proper attention has been given to the cataloguing, inventorying and labeling of thousands of specimens; to the conducting of scientific research upon many subjects; to enlargement and improvement of the study collections and facilities; and to public service in the form of supplying information to hundreds of inquirers upon subjects falling within the scope of the Museum. Details of these and other routine activities appear elsewhere in this Report.

Gratifying response was made to the annual spring and autumn courses of free illustrated lectures on science and travel given for the general public in the James Simpson Theatre of the Museum, and also to a series of special lectures for Members of the Museum given during the winter. The programs of these, and statistics on attend-

ance, will be found under the heading LECTURES AND ENTERTAINMENTS, beginning on page 47.

A greater number of children than in any previous year was reached by the activities of the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures, which was established in 1925 by Mrs. James Nelson Raymond. The Foundation in 1931 continued all the branches of its work conducted in former years, such as the sending of extension lecturers to the schools to give talks illustrated with lantern slides; the presentation of series of free motion pictures and other educational entertainments in the James Simpson Theatre during the spring, summer and autumn months; the tours of Museum exhibits conducted by guide-lecturers for groups of visiting children; and other activities. There was a notable increase both in the number of groups of children receiving these services, and in the total number of individuals affected, which aggregated 303,693. This upward trend in the number of children reached by Raymond Foundation activities has continued year after year since the work was first undertaken. There can be no doubt as to its great value as a medium of supplementary education which brings to the children of Chicago schools both knowledge and pleasure which would not ordinarily be available to them in the regular routine of their class rooms. The work of the Foundation is highly appreciated by educational authorities, school officials, principals and teachers, as well as by the children themselves, and many expressions of praise for it have been received. It has been particularly gratifying to receive such expressions from the children, as their favorable opinion indicates that the work is succeeding thoroughly with the ones for whom it was planned. It may be mentioned as of especial significance that this past year, and in several years preceding, a large number of letters have been received from children of the Four-H Clubs (an organization for rural young people which brings thousands of children annually to Chicago for the International Live Stock Exposition and invariably includes Field Museum among the places to be visited during their stay in the city) acknowledging with thanks the pleasure they have received due to the attentions given them by members of the Raymond Foundation staff.

A notable educational contribution in 1931, in addition to its regular activities, was made by the Raymond Foundation in cooperation with Radio Station WMAQ, operated by the *Chicago Daily News*. Each week over a long period an educational lecture for

children was given from this radio station by Miss Margaret M. Cornell, Chief of the Foundation staff. These lectures were heard by the children in the many schools which are equipped with radio receiving apparatus, as well as in the homes. Probably several hundred thousand composed the audience for each radio lecture.

The Museum's educational media have been increased by gifts from various sources of reels of motion pictures which are excellent material for use in the programs of the Raymond Foundation. Still other reels available for this use have resulted from Museum expeditions. During 1931 these were assembled, classified, and filed in fireproof containers which meet insurance requirements. The collection includes 153 positive reels of motion picture film, and thirty-one negatives.

More detailed accounts of the work of the Raymond Foundation, and statistics upon it, will be found in this Report beginning on page 48.

The Department of the N. W. Harris Public School Extension carried on as usual its work of supplementing the studies in the city schools by circulating among them traveling exhibition cases illustrating natural history and economic subjects. These reached, as previously stated, approximately 500,000 children, bringing them new material every two weeks during the school year. The Harris Extension has been in operation since 1912, and, as is generally known, its scope is confined principally to illustrating the flora and fauna of the Chicago area (defined for this purpose as the region within 100 miles of the city limits), and also the products of typical industries with the progressive steps occurring in their manufacture. Every effort is constantly made to attain as nearly as possible a complete representation of these subjects. More than 1,200 exhibition cases have been prepared to date. Due to the exigencies of transporting these to the schools, and the handling they get by the children, a number of these are always necessarily out of circulation for repairs, while others are withdrawn from time to time for improvements or reinstallations. However, in 1931 there were 1,136 cases available for circulation. Of these, 343 are devoted to botanical subjects (scientific and economic), 170 to geological subjects (scientific and economic), and 623 to zoological subjects. The zoology cases are divided as follows: birds, 319; mammals, 36; reptiles and amphibians, 40; fishes, 30; insects, 182; and economic zoology, 16. During 1931 the number of schools and other institutions served showed an increase, and the number of cases available was augmented

by the preparation of many new ones. The service of the Harris Extension is highly appreciated by educational authorities and by the school pupils, and there are frequent requests made by institutions not on the regular list to have the service extended to them. Where such institutions are of a type within the field designated for the Department, and where other factors make it practicable to do so, these requests are granted. The Department's activities are treated in full on page 174.

The plan of providing guide-lecture tours for adults on a schedule of two each day except Saturdays and Sundays was continued along the lines developed in the past few years. As usual, the variety of subjects covered was extensive, and the public responded in gratifying numbers to the opportunities presented through these tours. Besides the regular public tours, special guide-lecture service for groups requesting it was made available in accordance with the practice of past years.

Service to the general public by the Library of the Museum was increased as the facilities offered became more widely known. The outside visitors to the Library were largely students and members of the faculties of educational institutions in Chicago and vicinity. The books and pamphlets in the collection, now numbering approximately 93,000, were of service also to many others, such as representatives of industries, editors, authors, and researchers of various kinds. As usual the Museum staff was aided greatly in many branches of its work by the Library.

The study collections made available in each Department to students, persons engaged in research, and others, were used by many persons, and many expressions were heard indicating the value of this service to those who took advantage of it.

Normal activities were maintained in such Divisions of the Museum as Public Relations, Publications, Memberships, Printing, Roentgenology, Photography and Illustration. Detailed accounts of the work accomplished by these Divisions will be found in various sections of this Report.

A greater number of scientific publications were issued than in any previous year of the Museum's history. Among these were several outstanding works, upon which report will be found on page 56.

The monthly bulletin for Members of the Museum, *Field Museum News*, was published and distributed regularly each month. Every effort has been made to increase the value and attractiveness of this

publication, so that Members might receive complete news reports of the activities of the institution, advance notice of all special events in which they might be interested, and pictures of new or outstanding exhibits. Details of this work, and also a summary of general publicity and advertising carried on through the newspapers and various other media generously placed at the disposal of the Museum, will be found under the heading DIVISION OF PUBLIC RELATIONS (p. 176).

Some very interesting results have been obtained during the year from a series of research experiments on various problems carried out in the Division of Roentgenology. Among these was the development of a new technique whereby there was produced what is believed to be the largest x-ray film ever made, having as its subject an Egyptian mummy. The dimensions of the films are seven by two feet. This is the first time an entire adult mummy in its casket has ever been x-rayed on one film and with only one exposure. A more detailed account will be found on page 183 of this Report under the heading DIVISION OF ROENTGENOLOGY.

A *Handbook of Field Museum*, supplanting the former *Manual*, was published in 1931. This booklet gives in brief but comprehensive form general information concerning the Museum, its history, its building, its expeditions, and its varied activities. It is sold at a nominal price.

Various forms of cooperation were carried on during the year between the Museum and the University of Chicago. The students and faculty of the university were encouraged to make use of the study collections and special facilities of each Department of the Museum, and every possible aid was extended to them by the Museum staff. The general Library, and the departmental libraries of the Museum, were frequently consulted by groups of students, as well as individual students and members of the university faculty. Loans of books were made by the Museum Library to the libraries of the university, and vice versa. Members of the university faculty, especially Professors A. C. Noé and A. S. Romer, rendered invaluable services in connection with the preparation of the Carboniferous forest group in Ernest R. Graham Hall (Hall 38). The university made notable additions to the herbarium it has on deposit in the Museum Herbarium. Assistance in the identification of species was given in the Department of Zoology of the Museum to research workers from the university zoological faculty. Assistant Curator Karl P. Schmidt gave a lecture before the Biological Club of the

university. In the Museum's Department of Geology two Assyrian bronzes of great value belonging to the Oriental Institute of the university, which were in danger of destruction from corrosion, were restored by means of the Fink electrolytic process. Instruction in the installation and operation of the apparatus used in this process was given to a representative of the Oriental Institute by Associate Curator Henry W. Nichols. A series of minerals was sent on loan to a university worker for a study of their electrical properties. Work in the Museum's Egyptian hall, which has been in process of rearrangement and relabeling since 1927, was completed in 1931 by Dr. T. George Allen, whose part time services for this purpose were obtained through the cooperation of Professor James H. Breasted, Director of the Oriental Institute. In compliance with a request of the University High School of the University of Chicago, that school was added to the list of institutions receiving on regular schedule loans of traveling exhibition cases circulated by the N. W. Harris Public School Extension of Field Museum.

The Museum was host to a number of distinguished foreign guests during the year. Among these were Prince and Princess Takamatsu of Japan, who, attended by their suite, were visitors at the Museum on May 12; Count Hiroto Hayashi, member of the House of Peers of Japan, and Professor of Pedagogy in the Imperial University of Tokyo, who visited the Museum on August 12; Dr. Julius Magnes, President of the Hebrew University of Jerusalem, who was a visitor on May 8; and Dr. N. I. Vavilov of the Institute of Plant Industry, Leningrad, who made a visit in March. Dr. Magnes consulted with members of the scientific staff and formulated plans for exchange of specimens and publications between his university and Field Museum. Dr. Vavilov, who was returning from a tour of Mexico and Central America, consulted with members of the staff of the Department of Botany regarding economic plants of tropical America.

The Curator of Anthropology, Dr. Berthold Laufer, received an honorary degree of Doctor of Laws from the University of Chicago during the June commencement exercises at the university. This honor was in recognition of the important work in Asiatic research which has been conducted by Dr. Laufer.

There were several changes in the Museum staff during the year:

In November Mr. Rudyerd Boulton, formerly a member of the staff of the Carnegie Museum of Pittsburgh, joined the staff of Field Museum as Assistant Curator of Birds.

Mr. Colin C. Sanborn, formerly Assistant in Mammalogy, was promoted to the position of Assistant Curator of Mammals.

The services of Dr. T. George Allen of the Oriental Institute, University of Chicago, were re-engaged through 1931 in order to continue the work necessary for completion of the classification and labeling of the Egyptian archaeological material.

Dr. Ralph Linton, Professor of Anthropology at the University of Wisconsin, formerly an assistant curator at the Museum, was temporarily re-employed during the three months of his summer vacation from the university, to work on the reinstallation of Eskimo and Northwest Coast ethnological material in Hall 10.

Mr. C. Eliot Underdown was appointed Assistant in Ornithology.

Mr. Ulrich A. Dohmen, for more than thirty-five years Chief of the Division of Printing, died on May 21. Starting with hand-set type, foot-operated printing press, and himself as the only printer, Mr. Dohmen developed the plant in his charge to meet the increasing demands of the Museum's expanding publications, until now the plant is a large and complete one, with modern typesetting, printing, binding, and cutting machinery, and a large staff of workers. Mr. Dohmen's devotion to his duties and the great success he made of the printing plant were greatly appreciated by the administrative officers of the Museum, and his death represents a serious loss.

Mr. Dewey S. Dill, an assistant of Mr. Dohmen's for several years, has been placed in charge of the Division of Printing.

Under the Field Museum Employees' Pension Fund, insurance amounting to \$5,000 was paid to Mr. Dohmen's widow, and \$500 each to his daughters, Miss Gertrude Z. Dohmen and Mrs. Katherine Nardi.

Two other Museum employees died during the year. Mr. Stewart Herbert, clerk, died on April 10. Insurance of \$2,000 was paid to his mother, Mrs. Josephine Herbert, under the Museum Employees' Pension Fund. Mr. James Gibney, janitor, died on May 17. His widow received \$4,000 insurance under the same fund.

Mr. John Duffy, employed as a janitor since 1906, was placed on the pension payroll in 1931. He had reached the age of 71.

Mr. W. E. Eigsti was employed as an assistant taxidermist to take the place of Mr. Herman Hinrichs, who resigned.

Mr. Walter A. Weber, artist and ornithologist, resigned as of May 15. Mr. Pierce Brodkorb left the Department of Zoology after two months' temporary employment in the Division of Birds. Mr.

Daniel Clark, volunteer student assistant, served creditably for several months in the Division of Reptiles. Mr. G. C. Hixon served as special student assistant for some time in the Division of Mammals.

Dr. C. E. Hellmayr, Associate Curator of Birds, sailed July 9 for Europe, to accept, with the permission of the Museum, a position in a European university, under an agreement whereby he is to furnish the Museum annually with manuscript for further parts of the *Catalogue of Birds of the Americas*. This is a most important scientific work of which the first six parts have thus far been published by the Museum, and the plans call for four more parts to complete it. During the preparation and publishing of these additional parts, Dr. Hellmayr is to retain his title of Associate Curator of Birds.

Mr. James B. McNair, Assistant Curator of Economic Botany, terminated his services to the Museum on December 31. With the completion of roentgenograms of all Egyptian and Peruvian mummies, the Division of Roentgenology was closed, and the services of Miss Anna Reginalda Bolan were no longer required after November 30.

The services of Mr. Herman Lusche, assistant photographer, were discontinued on October 31. Six printers were removed from the payroll as of September 30, while the services of two employes of the Department of Botany were dispensed with on October 15, and of two preparators in the Stanley Field Plant Reproduction Laboratories on October 31.

Several carpenters who are paid on an hourly basis elected to go on a five-day week basis, beginning July 1. Other economies were effected in various wage scales.

Dr. J. Alden Mason, formerly Assistant Curator of Mexican and South American Archaeology, who is now Curator of the American Section of the Museum of the University of Pennsylvania, Philadelphia, spent several weeks at the Museum completing a manuscript for a publication on the results of the Marshall Field Archaeological Expedition to Colombia which he led in 1922-23.

During the autumn, winter, and spring months when the west door of the Museum is open, the Chicago Motor Coach Company consented to have stops made there by the buses which operate into Grant Park (No. 26, Jackson Boulevard line), as well as at the north entrance. This additional convenience provided for passengers bound for the Museum later had to be discontinued due to the modification of traffic regulations made by South Park authorities.

The buses now stop at the north entrance on both their eastbound and westbound trips.

That portion of the foot bridge from Michigan Avenue into Grant Park erected, at the expense of Field Museum, by the Illinois Central Railroad for the convenience of Museum visitors in the early days of occupancy of the present building, has been removed. The bridge was no longer necessary because of the close proximity of two other bridges, and it was thought desirable to eliminate the expense incurred in maintaining it. There remains, however, at the east end a link which connects with another bridge to the railroad station, thus serving Museum visitors who depend on the Illinois Central for transportation.

Due to the increasing aviation activities in the vicinity of the Museum, it was deemed advisable to insure the building and its contents against damage by aircraft. Accordingly, a policy covering a period of five years, and providing \$600,000 insurance against this hazard, was taken out.

Maintenance of the building, and improvements wherever practicable, received due attention. A number of the more important of such improvements are noted in the pages which follow.

At a cost of \$64,406.85, included in the building fund deficit contribution of \$91,099.44 paid in 1931 by President Stanley Field, the Museum's cafeteria was completely remodeled to provide better service and increased comforts for the public and the staff of the Museum. In the main cafeteria, with accommodations for 192 guests, an attractive scheme of decorations was adopted by painting maps of the continents, the Arctic and Antarctic regions, and the world as a whole on the walls (see Plate XXII). In a special room provided for the staff the wall decorations are based on Aztec designs. All the tables in this room are in attractive booths, except a large round table which is provided for the President, Director, and their guests, or for luncheon conference purposes. The special room for children and other visitors who bring their own lunches was improved, while an additional room close by, formerly used for the storage of archaeological material, was painted and provided with tables and benches to accommodate the overflow crowds on special occasions when the regular children's room is filled to capacity. A total of about 450 children can be accommodated in these two rooms.

The main cafeteria and other lunch rooms were provided with complete new furnishings, including tables, chairs, floor coverings,

china, silver, and all other accessories. The kitchen was provided with the most modern cooking, electric refrigeration, dishwashing, and other equipment.

Demands upon the cafeteria facilities have become more and more pressing during the past few years, due to the constantly increasing attendance at the Museum. The improvements which have been effected make it possible to meet these demands more efficiently. Operation of the cafeteria was placed in the hands of the John R. Thompson Company, a firm especially well qualified to fill requirements in respect to service, prices, quality of food, efficiency of management, and maintenance of the highest sanitary standards. Further details regarding the cafeteria will be found on page 185 of this Report.

The Museum's maintenance and engineering forces, in conjunction with some outside labor especially hired for the work, completed the remodeling of the cafeteria and the supplementary lunch rooms for the staff and for children. This task involved running fifteen new circuits for lights and eight new circuits for power through the tunnel from the switch room; installation of a ventilating system with three fans, and with a heating unit and an oil filter on the fresh air inlet; installation of electric washer and refrigerating units; removal of the old sewer and installation of a new sewerage system; reconstruction of plumbing; and moving and rebuilding of various partitions necessary to lay out the rooms in accordance with the new plans provided by the architects.

Praise for the Museum's system of ventilation was received from Dr. Siegfried Maurer, Chicago physician who has been conducting research and experiments to assist in the work of eliminating hay fever. In pollen counts taken in various Chicago public buildings by Dr. Maurer, Field Museum showed the lowest count. In certain other buildings the count was from ten to twenty times that in the Museum, and the Museum's count was only about one-half of that found at several northern resorts to which hay fever sufferers go for relief.

The maintenance force cooperated with all the Departments in the rearrangements and reinstallations of exhibits in various halls, which have been mentioned elsewhere. Eighteen cases of a new type with a single light of glass on each side were placed in Hall 13. Seven of the Knight murals were mounted on vehisote panels and fastened in place on the walls of Ernest R. Graham Hall (Hall 38), and all of the twenty-eight murals were washed and starched, while

their frames were regilded. Thirty-seven cases in Graham Hall were fitted with illuminating hoods, revarnished on the outside, and repainted inside. Various special installation fixtures were made for these. Eighteen cases of bird groups in Hall 20 were fitted with illuminating hoods.

All reinstalled cases in the Departments of Anthropology, Geology, and Zoology were repainted inside. In Hall 30, where the jade collection was installed, the walls were cleaned, a new linoleum floor covering was laid, and a panel was built over the center windows on which was hung an imperial Chinese tapestry. Eight new cases were provided to receive the jade installations.

In the South Gallery, where the Chinese pagoda models were reinstalled, the cases were fitted with beaver board bottoms, and twenty-seven Chinese paintings and tapestries were hung on the walls. In Harlow N. Higinbotham Hall (Hall 31), devoted to gems and jewels, the walls were cleaned and painted, and two ventilator grills were cut in the east wall.

In all, the maintenance force remodeled a total of eighty-one exhibition cases for the various Departments, and all of these were wired for lights by the engineering force. These cases are assigned as follows: eighteen for Hall 20; fourteen for Hall 24; eight for Hall 30; three for the Hall of Prehistoric Man (Hall C); thirty-seven for Ernest R. Graham Hall (Hall 38); and one for Hall O. Thirty electrical outlets were installed on the walls of Hall C.

In addition, eleven built-in cases were constructed for proposed groups in Hall C, and the ground work, framing, trim and glazing were furnished for fifteen groups, as follows: the undersea group of fishes in Hall O; the mound-builder's grave in Mary D. Sturges Hall (Hall 3); the model of a Mitla temple in Hall 8; the various new habitat groups of mammals in Halls 16 and 17; the new exhibits in Ernest R. Graham Hall (Hall 38); and the collections of Coptic textiles, and of tombstones and votive tablets, in the hall of Egyptian archaeology (Hall J).

Various work rooms and storage rooms on the third floor were repainted and provided with steel storage equipment. The steel equipment was provided in furtherance of the Museum's policy to eliminate as far as possible all fire hazards caused by wooden shelving, cabinets, etc., and to give better protection against all deteriorating influences which might harm scientific material in storage and supplies and equipment. Included in the new steel equipment installed this year are six assemblies of cabinets in the Herbarium,

twenty cabinets for bird and mammal storage, twenty-four cabinets for miscellaneous purposes, and racks for 136 storage cans containing specimens preserved in alcohol. In all, 7,173 square feet of steel shelving were provided on the third floor for the various Departments. In addition, 175 square feet were provided in the taxidermists' skin storage vault on the fourth floor, and 225 feet for the janitors' supplies on the ground floor.

Because of the need of beginning work in Hall B on the ground floor in preparation for the installation of Chauncey Keep Memorial Hall it was necessary to move the research classes of Art Institute students from the space they had occupied as quarters in this hall. Equally suitable quarters were provided for the art classes in a vacated room near the west end of Hall H on the ground floor. The rest of Hall B was cleared of material which had been stored in it.

Painting done during the year included the art students' new class room, the corridor leading to the cafeteria, the children's second or overflow lunch room, and fifteen rooms used for various purposes on the third floor.

Various rooms on the third floor were provided with additional tables and chairs made available when all old cafeteria equipment was replaced with new.

A new work room, eighteen by twenty-eight feet in dimensions, was built in the northwest corner of Room 38, the large workshop of the Department of Anthropology on the third floor, to provide quarters for the pottery mender, who will shortly be moved into the new quarters. This will make Room 29, the present pottery mending shop, available for a new storage room.

The old skin storage vault on the ground floor was removed to provide a clear floor area and additional space for Hall C, which is to be devoted to prehistoric man. The floor of this area was lowered to conform with the level of the rest of the hall. Partitions were built between Halls C and D.

The taxidermists' storage room in Hall Q on the ground floor was vacated. Part of the stored material was moved to the space under the south stairway, and part to Hall L.

To take care of the ever-increasing demands of the Library for additional space to accommodate the overflow of its collections of books, pamphlets, and periodicals, six book stacks were extended to provide additional shelves, and extra space was cleared and set aside in the east portion of Room 120 on the third floor close to the Library quarters. During the coming year it is planned to make

shelf provision in this space which, it is hoped, will relieve in great measure the congestion in the Library.

Two new rooms on the third floor for the use of students and other research workers were furnished and opened during the year. One of these is in the Department of Anthropology, and one in the Department of Geology. The rooms are appointed with tables, chairs, and collections of specimens especially selected for their usefulness to students. These rooms, Nos. 55 and 113A, were formerly used for storage of material.

The studio of the Division of Roentgenology was given a considerable overhauling to provide the conditions necessary for making the large seven-foot films which resulted from this Division's research work. The floor of the operating room was sheeted with lead; a mezzanine was built in this room to facilitate cleaning the x-ray lamp; a light-proof ventilator was provided in the dark room; and special developing and washing trays with cylinder attachment for suspending the large films, and various drying fixtures, were installed.

Since 1928 tuck pointing of all exterior walls, cornices, and parapet walls has been in progress, and this work was completed in 1931.

The work undertaken in the previous year to provide protection against water seepage under the steps at the north and south entrances was completed. This involved sinking a caisson, building a pier, rebuilding and tuck pointing bulkheads, lowering the terrace wall around the shipping room, setting a new level for the lower steps at the south entrance, taking up and resetting all lower steps at both entrances, building a new cement walk between the upper and lower steps of the south entrance, removing all ceiling tiles under the steps and replacing them with steel beams, scraping all steel work and painting it with a rust preventive compound, filling all step and platform joints with mastic top dressing, and sundry other operations. Five fans with heating units were installed under the north steps to maintain necessary air circulation.

Electric window fans were installed in the two public toilet rooms. Five window frames at road level in the west wall of the boiler room were replaced. On the third floor fifty-eight window sills, water bars, and lower parts of window frames which had rotted, were replaced with new material. A contract was renewed with a window cleaning concern to wash all windows periodically. The Museum's own maintenance force continued to carry on the cleaning of windows at such other times as conditions required it.

The recommendations made by the underwriters carrying the Museum's fire insurance have been put into effect.

In the boiler room all the boilers were turbinized, and the brick settings were repaired. The Museum engineering crew also overhauled all other equipment in the boiler room and the pump room.

A system to effect a saving in the cost of lighting the building has been put into force. The saving reached its maximum in December when a reduction of 20,000 kilowatts was made in the use of electricity as compared with December of the preceding year. This is approximately 20 per cent. It is expected that this percentage of saving in kilowatts used will be maintained throughout 1932.

Steam for heating was furnished under contract to the John G. Shedd Aquarium during the seasons requiring heat, and to Soldier Field from November 6 to December 10.

LECTURES AND ENTERTAINMENTS

GENERAL LECTURES.—The Museum's fifty-fifth and fifty-sixth courses of free lectures for the public were given in the James Simpson Theatre on Saturday afternoons during the spring and autumn months. They were illustrated by motion pictures and stereopticon slides. Following are the programs of both courses:

FIFTY-FIFTH FREE LECTURE COURSE

- March 7—The Lost Valleys of the Caucasus.
Mr. William Osgood Field, Lenox, Massachusetts.
- March 14—The Human Side of the Byrd Expedition.
Chief Yeoman Charles E. Lofgren, United States Navy (retired);
Personnel Officer of the Byrd Expedition to the Antarctic.
- March 21—Australian Life and Scenery.
Professor Griffith Taylor, Professor of Geography, University of Chicago.
- March 28—Exploring the Jungles of Surinam.
Mr. Jean M. F. Dubois, Denver, Colorado.
- April 4—Alaska.
Mr. Amos O. Berg, Ottawa, Ontario, Canada.
- April 11—Across Asia's Snows and Deserts.
Mr. William J. Morden, Associate in Mammalogy, American Museum of Natural History, New York.
- April 18—The Tale of the Ancient Whaleman.
Mr. Chester Scott Howland, Boston, Massachusetts.
- April 25—Three-wheeling through Africa.
Mr. James C. Wilson, Iowa State College, Ames, Iowa.

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FIFTY-SIXTH FREE LECTURE COURSE

- October 3—An African Hunting Trip.
Dr. Thomas S. Arbutnot, Pittsburgh, Pennsylvania.
- October 10—Burma.
Mr. Louis H. Baker, Hamilton, Ontario, Canada.
- October 17—Bryce, Zion and Grand Canyons.
(Illustrated with Lumiere Autochrome Plates.)
Dr. C. O. Schneider, Chicago.
- October 24—Pioneering in the Canadian Peace River Country.
Professor Charles C. Colby, Professor of Geography, University of Chicago.
- October 31—East of Suez.
Mr. H. C. Ostrander, Yonkers, New York.
- November 7—Mexico.
Mr. Fred Payne Clatworthy, Estes Park, Colorado.
- November 14—Explorations in the Old Maya Empire.
Dr. Sylvanus G. Morley, Carnegie Institution, Washington, D.C.
- November 21—On the Trail of the Viking.
Captain Donald B. MacMillan, Provincetown, Massachusetts.
- November 28—Camera Shooting in the Southern Marshes.
Mr. Alfred M. Bailey, Director, Chicago Academy of Sciences.

The total attendance at these seventeen lectures was 22,773.

In addition to the regular spring and autumn courses, the following special lectures were given for Members of Field Museum:

- January 11—The Nile and Beyond.
Major A. Radcliffe Dugmore, F.R.G.S., F.R.P.S., London, England.
- January 18—A Naturalist in the South Seas.
Mr. Karl P. Schmidt, Assistant Curator of Reptiles, Field Museum; leader of the scientific section of the Cornelius Crane Pacific Expedition for Field Museum, 1928–29.
- January 25—Explorations in Plant and Animal Life.
Mr. Arthur C. Pillsbury, Berkeley, California.

The total attendance at these three special lectures was 1,535.

The total number of lectures for adults was twenty and the total attendance at them was 24,308.

JAMES NELSON AND ANNA LOUISE RAYMOND
FOUNDATION FOR PUBLIC SCHOOL AND
CHILDREN'S LECTURES

The James Nelson and Anna Louise Raymond Foundation has continued to provide lecture and entertainment programs for children



AMERICAN TAPIR
(Hall 16)

Marshall Field Brazilian Expedition, 1926. Taxidermy by Julius Friesser. Background by Charles A. Corwin
About one-fifteenth actual size

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both at the Museum and outside in schools and camps, and has endeavored by means of guide-lecture tours, radio talks, and in other ways to broaden the contact between the Museum and the public.

ENTERTAINMENTS FOR CHILDREN.—Three series of entertainments were offered during the year. As in previous seasons, the spring and autumn courses were given on Saturday mornings in the James Simpson Theatre, and the summer series, offered on Thursday mornings during the months of July and August, was given in the exhibition halls and in the Theatre. Following are the programs of these three series of entertainments:

SPRING COURSE

February 21—Washington Becomes President*
Alexander Hamilton*
Washing the Elephants
Stickleback, the Hedgehog

February 28—Beauties of Winter
The Falls of Iguassu
A World Unseen
Insect Farmers and Laborers
Plant and Animal Death-traps

March 7—The Antics of the Kilowatt
The Eagle's Nest
Allah il Allah

March 14—America Raises Rubber
Thrills in Yellowstone
Capturing a Giant Anteater

March 21—Fine Furs on Fine Animals
Picturesque Roumania

March 28—A Jaguar in Stone
Belgian Cities
How Buds Become Leaves
Fishes of Many Waters
Hagotian, the Rug-maker

April 4—The Story of Silk
Pineapples
Life in a Pond
Undersea Partnerships
The Life History of a Pearl

April 11—The Story of Asbestos
Firemaking without Matches
Drummers and Boomers
Porcupines and Their Neighbors

April 18—The Island of Sugar
Prodigal Palms
Poor Butterfly
The Message of the Flowers

*Gift to the Museum from the late Mr. Chauncey Keep.

April 25—In Batik Land
A Dyak Wedding
Teak-logging in Siam
Elephants on Parade
Wooden Shoes

The total attendance at these ten entertainments was 11,711.

AUTUMN COURSE

September 26—When Autumn Comes
Hiawatha's Hunting Grounds
Feathered Braves
Naskapi Indians
The First People

October 3—Elephant Seals
Shooting Rapids
Sheep in Psalm and Sage
Cowboy Thrills

October 10—Columbus*
Tricks or Weapons?
Secrets of the Sea

October 17—The Sacred Beetle
Wonder Book III
From Mountain to Cement Sack
The Dogville Theatre

October 24—Glimpses of India
People in White (Korea)
When Elk Come Down
How Rangers Fight a Fire

October 31—The Settlement of Jamestown*
A Trip to a Zoo

November 7—Maizok of the South Seas
Magic Gems

November 14—The Eve of the Revolution*
A Trip to Banana Land
Unselfish Shells

November 21—The Declaration of Independence*
The Hamster Family
A Jungle Roundup

November 28—The Pilgrims*
Animals Prepare for Winter
Children of the Sun

December 5—Winter Birds
Snowflakes
Mr. Groundhog Wakes Up
Skating in the Spreewald

* Gift to the Museum from the late Mr. Chauncey Keep.

The total attendance at the eleven autumn entertainments was 20,611.

The summer course was planned especially for the benefit of those young people who remained in the city during the summer vacation. As in former years the course consisted of special tours in the exhibition halls, and story-hours and motion pictures in the James Simpson Theatre. The programs were as follows:

- July 9—Motion Picture:
With Byrd at the South Pole.
- July 16—Story-hour: Giants of Long Ago.
Tour: Prehistoric Collections.
- July 23—Tour: The Chinese Halls.
Motion Picture:
Glimpses of China.
- July 30—Motion Picture:
The Silent Enemy.
- August 6—Story-hour: Children of Many Lands.
Tour: Exhibits Showing Child Life in Many Lands.
- August 13—Tour: Animals of Land and Water.
Motion Pictures:
Alligators.
Alaskan Sheep.
Bears.
Animals of the Galapagos.
Lions at Home.

The total number of groups handled during this summer course was twenty-three and the attendance was 10,406. Of this number 2,181 represents the special tour attendance and 8,225 the Theatre attendance.

In addition to the two regular courses of entertainments and the summer series, four special programs were offered during the winter months as follows:

- January 24—Motion Picture:
The Black Journey.
- January 31—Motion Pictures:
A Dog-sled Trip in Canada.
The Ojibwa Build a Birch-bark Canoe.
Gathering in the Wild Rice.
(Pictures taken and explained by Mr. W. W. Kirkland.)
- February 12—Motion Pictures:
Abraham Lincoln:
My Father.
Abe's First Law Case.
The Call to Arms.
- December 19—Motion Pictures:
I Am from Siam.
The Beaver People.

The total attendance at the four special programs was 8,001.

In all, thirty-one different programs were offered free to the children of the city and suburbs during the year, and the total attendance at these entertainments was 50,729.

That the children's entertainments are now recognized as a definite part of child education in the community is evidenced by the great number of schools and social organizations which regularly send groups, and by the excellent cooperation extended to the Museum in giving publicity to these programs. Posters and programs are now shown in both city and suburban libraries, in public and parochial schools, in social settlements, clubs and churches. Many newspapers and radio stations have helped. Not only Chicago but suburban newspapers have printed the programs and have frequently given much space to special attractions. Parent-teacher associations have distributed programs and chaperoned groups which otherwise would not be able to attend. The children's department of the *Chicago Daily News* has frequently carried the features of the children's programs in its section of the paper. The following newspapers and radio stations were especially consistent in giving publicity to the entertainments: the *Chicago Daily News* and Radio Station WMAQ; the *Prairie Farmer* and Radio Station WLS; the *Chicago Tribune*; Radio Station WCFL; the *Chicago Evening American*; the *Chicago Herald and Examiner*; and the *Chicago Evening Post*.

An expression of appreciation for films loaned for the programs is due to the United States Department of Agriculture, the Izaak Walton League, the General Electric Company, the Commonwealth Edison Company, the Citroen Motor Company of Paris, the Chicago, Milwaukee and St. Paul Railroad, the Natural History Museum of the University of Minnesota, and the Department of the Interior, Canada.

MUSEUM STORIES FOR CHILDREN.—Two series of Museum Stories for Children were written by members of the Raymond Foundation staff, and copies were handed to all attending the entertainments. The demand for stories has increased greatly during the past year. An encouraging feature is the number of children who have bound their copies of Museum Stories into book form for use as permanent reference material. During the summer, the stories were also kept at the main entrance and handed to visiting children, or to teachers, for use as source material.

PRAIRIE CHICKEN

PRAIRIE CHICKEN



MADE BY
THE FIELD MUSEUM OF NATURAL HISTORY

TYPE OF CASE LOANED TO THE SCHOOLS OF CHICAGO BY THE N. W. HARRIS PUBLIC SCHOOL
EXTENSION OF FIELD MUSEUM OF NATURAL HISTORY

One-sixth actual size

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

The following list gives an idea of the variety of topics to be found in Series XVI and Series XVII of Museum Stories for Children, published in 1931:

Sir Stickleback, the Hedgehog	Seals
Glimpses of Ant Life	Coral
Boats	The Sacred Beetle of Egypt
Bears	The Land of the Morning Calm
The Weasel and the Mink	The Anteaters
Deep Sea Fishes	Precious Stones
Pearls	Bananas
Asbestos	Sloths
Palms	Children of the Sun
In the Land of Dikes and Windmills	Reindeer
Games and Toys of Indian Children	

A total of 50,740 copies of Museum Stories for Children was distributed during the year.

LECTURE TOURS FOR CHILDREN.—The number of groups of children from public, parochial and private schools coming to the Museum for lecture tours established a new record. Special emphasis was laid on work with the younger children, and with high school students. Crane High School led in the number of pupils taking advantage of the intensive work given in the various halls. During the year 1,513 pupils from that school, with eleven different instructors, visited the botanical, paleontological and zoological exhibits under the leadership of lecturers of the Raymond Foundation. May 27 was an outstanding day, with groups received from nineteen schools, and also a large party from downstate brought by the Illinois Central Railway. Each group was given a lecture tour. The number of suburban schools asking guide-lecture service showed a marked increase over former years. The following table shows how the groups were distributed:

	Number of schools	Attendance
Tours for children of the Chicago schools		
Chicago public schools.....	275	11,399
Chicago parochial schools.....	23	962
Chicago private schools.....	18	339
Tours for children of suburban schools		
Suburban public schools.....	238	8,400
Suburban parochial schools.....	17	642
Suburban private schools.....	13	351
Tours for special groups		
Children's clubs.....	31	900
Other organizations.....	20	2,282
Out-of-town groups.....	16	1,426

In all, 651 groups were given guide-lecture service and the attendance was 26,701.

EDUCATIONAL MEETINGS.—The small lecture hall was used for seventeen meetings of an educational or civic nature given for children. The total attendance at these was 1,093.

EXTENSION LECTURES.—Extension lectures were offered, as in previous years, to the public schools of the city. For the first time, requests for the lectures were received from parochial schools, and it is hoped that the service will be gradually extended to all kinds of educational institutions.

The subjects offered for high school classes and assemblies were:

Field Museum and Its Work	Bird Life in the Chicago Area
The Ancient Egyptians	Animal Life in the Chicago Area
The Romans: Their Arts and Customs	Trees of the Chicago Area
Prehistoric Animals	Wild Flowers of the Chicago Area
Reptiles and Insects	Story of Iron and Steel

For presentation in the elementary schools the following series were offered:

For Geography and History Groups	{	South America
		North American Indians
		Glimpses of Chinese Life
		Marcus, the Roman
		Ptahhotep, the Egyptian
		Migisi, the Indian Lad (lower grades)
		Native Life in the Philippines
For Science Groups	{	Field Museum and Its Work
		A Trip to Banana Land
		Coffee, Chocolate and Tea
		Coal and Iron
		Flax and Cotton
		Silk and Wool
		Food Fishes of the World
		Animal Life in the Chicago Area
		Birds of the Chicago Area
		Trees of the Chicago Area
		Wild Flowers of the Chicago Area
		Animals at Home
		Our Outdoor Friends (lower grades)

These lectures were given also before school clubs, parent-teacher associations and at Camp Algonquin. The following table gives the classification of groups, number of groups and attendance of the groups reached by the extension lecturers of the Museum during the year:

	Number of groups	Attendance
In Chicago schools.....	657	225,025
Parent-teacher associations.....	2	170
School clubs	7	410
Camp Algonquin.....	17	1,746

The total number of extension lectures presented by the staff of the Raymond Foundation was 683, and the total attendance at these was 227,351.

NATURE STUDY COURSE.—At the request of the Chicago Council of Boy Scouts of America, the third series of talks on natural history topics was arranged for the scoutmasters of the city. The series consisted of five meetings. At each a member of the Raymond Foundation staff presented a subject which would be of value to leaders of Scout groups, and also assisted in the conference which followed. The subjects were as follows:

February 28—Birds of the Chicago Area
March 7—Ecology of the Chicago Area
March 14—Insects and Reptiles
March 21—Trees and Flowers of the Chicago Area
March 28—Geology and Mammals of the Chicago Area

The total attendance at these lectures and conferences was 642.

RADIO BROADCASTING.—Radio broadcasts by the Raymond Foundation staff were given in connection with the school radio programs sponsored by Station WMAQ. During the year, twenty-eight talks were presented to grades ranging from the first to the fifth. The talks given were planned to correlate with the course of nature study being given in the elementary grades. The manager of one of the radio stations reports that these nature study talks are being used regularly in schools in Indiana, Ohio, Michigan, Wisconsin and Nebraska, and that the published outlines are sent each month to many other states.

During the summer course of entertainments, broadcasting material was prepared each week for the radio stations giving publicity to the children's programs.

ACCESSIONS.—The Raymond Foundation acquired during the year 208 stereopticon slides for use in the Theatre and in the extension lectures; fourteen negatives for making slides; and thirty-three prints for the office records, all made by the Division of Photography.

The Raymond Foundation also was the beneficiary of the following gifts to the Museum: two motion picture reels, *From Mountain to Cement Sack*, presented by the Atlas Cement Company; 2,300 feet of film made in Africa and presented by Mrs. Marshall Field; two reels and two negatives of African animals given by Captain Harold

A. White; and eighty stereopticon slides of scenes in the Near East received from Mr. Henry Field.

LECTURE TOURS AND MEETINGS FOR ADULTS

As in preceding years, the services of Museum guide-lecturers were offered, without charge, to clubs, conventions, and other organizations, and to Museum visitors in general. For the public 138 general tours and 376 tours covering specific exhibits were arranged. Printed monthly tour schedules were placed at the main entrance for distribution to visitors. Each month copies of the schedule were sent to libraries, social settlements, retail stores and to some of the railroads bringing special groups into the city, while the schedule for each week was published in Chicago and suburban newspapers.

The groups which took advantage of the guide-lecture service during the year numbered 555, with a total attendance of 7,256 individuals.

The use of the small lecture hall was extended to six adult educational and civic groups. These meetings were attended by 339 persons.

On May 27 the graduating exercises of the foreign adults who had been studying in the public schools of the city were held in the James Simpson Theatre. The attendance was 854.

On Armistice Day an Americanization program under the auspices of the Chicago Board of Education was held in the James Simpson Theatre. The attendance was 362.

SUMMARY OF ATTENDANCE AT LECTURES, ETC.

The total number of groups receiving instruction by means of lectures, entertainments and tours was 1,965 with an aggregate attendance of 336,812. This figure includes both the adults and the children participating in Museum educational activities. Of these totals, 1,382 groups with an aggregate attendance of 303,693 were reached through the activities of the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures.

DIVISION OF PUBLICATIONS

The number of scientific publications issued by Field Museum in 1931 exceeded that of any previous year. The Museum distributed to the institutions on its exchange lists 14,726 copies of

scientific publications and 1,121 copies of miscellaneous publications and pamphlets. In addition, 5,623 copies of the 1930 Annual Report of the Director were sent to Members of the Museum. Sales during the year totaled 1,136 publications, 6,982 leaflets, and 9,647 miscellaneous publications and pamphlets.

Twenty-eight large boxes containing publications for foreign institutions were packed and shipped to the Smithsonian Institution at Washington, D.C., for distribution through its bureau of international exchanges. For future sales and distribution 905 packages, containing more than 25,500 copies of books issued in 1931, were wrapped, labeled, and stored in the stock room.

During the year forty-nine new exchange arrangements with domestic and foreign institutions were established.

A most interesting volume was added to the Anthropology Memoirs Series in November. This is a monograph by Professor Roy L. Moodie, entitled *Roentgenologic Studies of Egyptian and Peruvian Mummies*. Its purpose is to add to knowledge about mummification through an interpretation of roentgenograms of unopened mummy packs in Field Museum. It discusses conditions revealed in Egyptian and Peruvian mummies by roentgenograms prepared in the Division of Roentgenology of Field Museum, and places particular emphasis on the search for evidences of disease and injury. The book is of especial interest to pathologists, odontologists, students of the history of medicine, roentgenologists and archaeologists. The volume, complete in one number, contains sixty-six printed pages and seventy-six plates in photogravure, chiefly from roentgenograms.

The *Handbook of Field Museum*, published in June, is an informative illustrated booklet of convenient size. The number of requests for it during the past six months has been very gratifying. It is designed to give briefly general information concerning the Museum, its founding and its present organization, the building in which it is housed, its exhibits, expeditions and various activities, its endowments, and many other matters regarding which inquiries are constantly received.

Of the portfolio of lithographic reproductions of Abyssinian birds and mammals published in 1930, nearly 400 additional copies were sold during 1931. This can be accounted for by the prominence of the artist, the late Louis Agassiz Fuertes, who made the original paintings, and by the excellence of the reproductions. The portfolio was distributed late in 1930 to the Museum's ornithological exchange

list, and numerous letters of praise have been received from institutions and scientists in this country and abroad. An expression of appreciation is again due to Mr. C. Suydam Cutting, whose generosity made possible the publishing of this album.

Twenty-two additions to the regular series of Field Museum publications were issued, four of which were anthropological, nine botanical, three geological, five zoological, and one the Annual Report of the Director for 1930. Besides these, two anthropology memoirs, a design series number, a handbook and a general guide were published. Following is a detailed list:

Publication
number

- 283.—Botanical Series, Vol. X. Flora of the Lancetilla Valley, Honduras. By Paul C. Standley. January 15, 1931. 418 pages, 68 photogravures. Edition 1,034.
- 284.—Botanical Series, Vol. VIII, No. 4. The Cyperaceae of Central America. By Paul C. Standley. January 26, 1931. 56 pages. Edition 1,073.
- 285.—Botanical Series, Vol. VII, No. 2. The Rubiaceae of Ecuador. By Paul C. Standley. February 5, 1931. 76 pages. Edition 1,056.
- 286.—Zoological Series, Vol. XVIII, No. 2. Bats from Polynesia, Melanesia and Malaysia. By Colin Campbell Sanborn. February 12, 1931. 26 pages. Edition 1,072.
- 287.—Report Series, Vol. VIII, No. 2. Annual Report of the Director for the Year 1930. January, 1931. 256 pages, 20 photogravures. Edition 7,541.
- 288.—Botanical Series, Vol. XI, No. 1. Spermatophytes, Mostly Peruvian—III. By J. Francis Macbride. May 29, 1931. 36 pages. Edition 1,022.
- 289.—Anthropological Series, Vol. XXI, No. 1. Serpent Worship in Africa. By Wilfrid D. Hambly. July 29, 1931. 86 pages, 8 photogravures and 1 map. Edition 1,051.
- 290.—Zoological Series, Vol. XVIII, No. 3. Birds of the Kelley-Roosevelts Expedition to French Indo-China. By Outram Bangs and Josselyn Van Tyne. June 10, 1931. 90 pages, 2 colored plates and 1 map. Edition 1,203.
- 291.—Botanical Series, Vol. XI, No. 2. Spermatophytes, Mostly Peruvian—IV. By J. Francis Macbride. July 29, 1931. 34 pages. Edition 1,046.
- 292.—Botanical Series, Vol. VII, No. 3. The Rubiaceae of Bolivia. By Paul C. Standley. June 16, 1931. 88 pages. Edition 1,036.
- 293.—Zoological Series, Vol. XVIII, No. 4. The Painted Turtles of the Genus *Chrysemys*. By Sherman C. Bishop and F. J. W. Schmidt. June 18, 1931. 20 pages, 5 zinc etchings. Edition 1,044.
- 294.—Botanical Series, Vol. VIII, No. 5. Studies of American Plants—V. By Paul C. Standley. June 25, 1931. 106 pages. Edition 1,041.
- 295.—Zoological Series, Vol. XVIII, No. 5. Two New Rodents from Costa Rica. By Wilfred H. Osgood. August 3, 1931. 6 pages, 1 photogravure. Edition 1,073.
- 296.—Zoological Series, Vol. XVIII, No. 6. Notes on *Dinomys*. By Colin Campbell Sanborn. August 31, 1931. 10 pages, 1 photogravure. Edition 1,054.

- 297.—Geological Series, Vol. IV, No. 6. Occurrence of the Alligatoroid Genus *Allognathosuchus* in the Lower Oligocene. By Bryan Patterson. August 31, 1931. 8 pages, 1 photogravure. Edition 1,055.
- 298.—Geological Series, Vol. IV, No. 7. A Silurian Worm and Associated Fauna. By Sharat Kumar Roy and Carey Croneis. September 24, 1931. 22 pages, 4 photogravures. Edition 1,021.
- 299.—Geological Series, Vol. IV, No. 8. A Fossil Turtle from Peru. By Karl P. Schmidt. September 4, 1931. 6 pages, 2 photogravures. Edition 1,022.
- 300.—Anthropological Series, Vol. XVIII, No. 3. The Domestication of the Cormorant in China and Japan. By Berthold Laufer. September 8, 1931. 64 pages, 4 photogravures. Edition 1,056.
- 301.—Anthropological Series, Vol. XVII, No. 3. Archaeological Investigations in the Southern Cayo District, British Honduras. By J. Eric Thompson. September 18, 1931. 148 pages, 28 photogravures. Edition 1,020.
- 302.—Botanical Series, Vol. VII, No. 4. The Rubiaceae of Venezuela. By Paul C. Standley. October 12, 1931. 146 pages. Edition 1,031.
- 303.—Botanical Series, Vol. XI, No. 3. The Nyctaginaceae and Chenopodiaceae of Northwestern South America. By Paul C. Standley. October 20, 1931. 56 pages. Edition 1,056.
- 304.—Anthropological Series, Vol. XX, No. 1. Archaeology of Santa Marta, Colombia. The Tairona Culture. Part I. Report on Field Work. By J. Alden Mason. December 14, 1931. 130 pages, 64 photogravures, 1 map. Edition 1,016.

MISCELLANEOUS PUBLICATIONS

- Anthropology, Memoirs, Vol. I, No. 3. Report on Excavations at Jemdet Nasr, Iraq. Part III. By Ernest Mackay, with preface by Stephen Langdon. August 18, 1931. Quarto size, 88 pages, 18 photogravures. Edition 825.
- Anthropology, Memoirs, Vol. III. Roentgenologic Studies of Egyptian and Peruvian Mummies. By Roy L. Moodie, with editor's note by Berthold Laufer. November 30, 1931. Quarto size, 66 pages, 76 photogravures. Edition 763.
- Anthropology Design Series, No. 5. Carved and Painted Designs from New Guinea. By A. B. Lewis. January, 1931. 1 photogravure, preface of 3 pages, 51 halftones, 1 zinc etching. Edition 1,549.
- Handbook. General information concerning the Museum, its history, building, exhibits, expeditions and activities. June 4, 1931. 67 pages, 8 halftones. Edition 3,006.
- General Guide. Fifteenth Edition. 40 pages, 1 photogravure, 3 zinc etchings. Edition 9,857.

POST CARDS.—The total number of picture post cards sold during 1931 was 138,514. This represents a decrease, which was noted in the volume of sales of both individual cards and sets of cards, and undoubtedly it may be attributed to the general depressed financial conditions existing during the year. Among new cards issued is an attractive view of the Museum building, from a photograph by Henry Fuermann and Sons, Chicago.

A new set was added to those issued by the Department of Geology. It consists of six views of the restorations in the Museum's group in Ernest R. Graham Hall (Hall 38) representing *Mesohippus*, the three-toed horse.

The supply of "school sets," consisting of twenty pictures of selected subjects in post card size with descriptions on the reverse side, was completely exhausted. To take their place sixteen post cards from the general series were placed in packets and sold as sets. These have proved to be as popular as the sets for which they were substituted, and as each card is suitable for mailing they are even more useful.

LIBRARY

The use of the Library by the public has continued to increase, as more and more people are learning that here are available books on certain subjects which are not easily found elsewhere. Exclusive of members of the Museum staff the Library received 995 visitors during 1931. Telephone inquiries for various kinds of information also have increased greatly.

There have been 2,900 books accessioned and 10,800 cards have been added to the catalogue.

The shelves in the General Library had become much congested, and to relieve one portion six extra stacks were added. This made it possible to arrange the books in this section properly, and thus make them more accessible.

In the last Annual Report acknowledgment was made of the receipt by the Library of publications from several former exchanges which for many years had sent nothing. As the Library depends for growth and usefulness largely on its exchanges, it is most encouraging to be able to report that this year still other institutions have either sent such numbers of their publications as were lacking, or have at least sent as many as were available. It is a great satisfaction to have these, because broken files of publications always make it possible that something most needed will be missing. Much of the desirable and necessary material of today appears first in the reports and proceedings of various societies and these publications are most important.

Some further advance has been made toward completing files of periodicals. Work in disposing of duplicate material has been continued. Some new exchange arrangements with other libraries and with individuals have been effected and these have helped in



MINIATURE OF A VILLAGE OF THE MENANGKABAU, SUMATRA
(Hall G)

Modeling by John G. Prasuhn. Background by Charles A. Corwin

THE LIBRARY
OF THE
UNIVERSITY OF CALIFORNIA

completing files already in the different Departments. Several sales have been made to dealers and to private collectors.

The three concluding volumes of Curtis's *The North American Indian* were presented to the Library this year by President Stanley Field. This work, representing thirty years of research, is a highly valued acquisition. The volumes previously received have already proved their worth, and it is exceedingly gratifying now to have the complete set.

The Marshall Field Archaeological Expedition to Europe in 1930, led by Assistant Curator Henry Field, was instrumental in bringing to the Library its largest increase at one time from any single source. This material arrived early in 1931, adding 5,000 books and pamphlets to the shelves. The assembling of this collection required a vast amount of time and patience on the part of Mr. Field and Mr. Harper Kelley of Paris, who aided him in selecting the books. These works are all on the subject of prehistory, and they cover especially well the European phase of the subject. The large collection of pamphlets includes many by early authors whose writings are available in no other form, and the Library is most fortunate to receive these. This collection places the Library in a position to be of greater assistance to students of this subject. Already many of these publications have been used for reference in connection with work being conducted by the Museum and also by outsiders.

The Marshall Field Archaeological Expedition to British Honduras, led by Assistant Curator J. Eric Thompson, brought to the Library desirable material relating to the Maya people. Included in this were *Diccionario de Motul Maya Espanol* and the two volumes of Ximenez, *Historia de la provincia de San Vicente de Chiapas y Guatemala*.

The National Geographic Society presented the Museum with a copy of Bingham's *Machu Picchu*, which is a report on explorations and excavations conducted in Peru during 1911-12 and 1915 under the auspices of the Society and Yale University. This is of special interest because of the work of Field Museum in that country.

Dr. Sylvanus G. Morley presented a photostated copy of the *Book of Chilam Balam*; from Dr. Casey A. Wood was received a copy of his *Index to the Literature of Vertebrate Zoology as Found in the Library of McGill University*; from Mr. A. M. Henderson came the second edition of Jappel's *Expedition to Borneo of H.M.S. "Dido."* The Japan Society of New York presented Cram's *Impressions of Japanese Architecture*. The Fisheries Society of Japan sent the first

volume of its beautifully illustrated work, *Illustrations of Japanese Aquatic Plants and Animals*. Mr. Jean Delacour of Clères, France, presented the four volumes of his *Les oiseaux de l'Indo-Chine française* which will be valuable to the Museum's zoologists in work on the large collections of animals recently received from Indo-China. From the Harvey Bassler Foundation were received *Die Indianer nordost Peru* and *Menschen ohne Gott*, both of which are especially valuable additions because of Field Museum's work in the part of the world with which these books are concerned. From Mr. B. K. Smith was received a copy of Buckland's *Reliquiae diluvianae*.

Mr. G. A. Pfeiffer, of New York, presented the Library with the *Einganzungsheft und Register*, which adds materially to the working value of the reprint of the four volumes of a rare work, Siebold's *Nippon*, which he gave to the Museum in 1930.

The story of the Vernay-Lang Kalahari Expedition of Field Museum is recorded in three albums of photographs presented by Mr. Arthur S. Vernay.

Among the purchases of the past year may be mentioned the following: Bailey and Zoe, *Hortus*; Drude, *Handbuch der Pflanzengeographie*; Veitch, *Hortus Veitchii*; Vellozia; Buffon, *Historie naturelle mise en ordre par Lacépède*, seventy-six volumes, 1799-1809; Byron, *Voyage of the "Blonde,"* 1826; Dalgleish, *Collection of Birds from Uruguay*, 1794; Kramer, *Elenches vegetabilium et animalium per Austrian, etc.*, 1756; Meyer, *Zoologische Annalen*, 1794; Peters, *Check List of the Birds of the World*, Volume 1; Siemssen, *Handbuch zur System kenntnis Mecklenburgischen Vögel*; Stoddard, *Bobwhite Quail*; Fischer, *Chinese Painting of the Han Dynasty*; Gann and Thompson, *History of the Mayas*; Hooton, *Up from the Ape*; Sir Arthur Keith, *Early Man*; Leakey, *Stone Age Cultures of Kenya Colony*; Soulié, *History of Chinese Art*.

The courtesies of other libraries which have assisted the members of the Museum staff by the loan of books are acknowledged with appreciation. The John Crerar Library, the Library of Congress, and the Library of the United States Department of Agriculture have been especially generous with their material.

EXPEDITIONS AND RESEARCH

ANTHROPOLOGY.—During the year five expeditions were operating in the interest of the Department of Anthropology.

The Field Museum Expedition to the Southwest, which was inaugurated in 1930, resumed operations during the summer of this

year, continuing its archaeological activities on the Lowry ruin in southwestern Colorado. Assistant Curator Paul S. Martin, leader of the expedition, left Chicago by motor car on May 30 and returned to the city September 28. The length of time spent actually in the field amounted to fifteen weeks. As in 1930, the expedition was financed from the income of a fund donated by Mr. Julius Rosenwald and the late Augusta N. Rosenwald.

During the expedition's field operations from seven to nine men were employed as diggers. The first task was to cap with cement, for purposes of preservation, the tops of all the walls exposed last year. Cement and sand were trucked from Dolores, Colorado, thirty-two miles distant. Due to the local drought, it was necessary to haul water fourteen miles. The cement was laid on the wall in a trough-like fashion, with short stone gutters set at intervals, so that all moisture would be carried away from the walls.

Excavations had meanwhile been started near the south end of the pueblo on a kiva designated by Dr. Martin as Kiva B. Kiva B is an early ceremonial chamber which had been abandoned and filled with a loess deposit. In later times, another kiva (Kiva A, excavated in 1930) had been built over it, so that it was necessary to dig through the floor of Kiva A and to re-enforce the upper walls with timbers to prevent them from collapsing. This was done so successfully that not a single stone of the upper chamber fell. The loess deposit which filled the lower kiva was excessively hard. The lowest level of dirt had to be shoveled up and out some seventeen feet.

Particularly gratifying was the fact that the mural decorations on the lower walls were well preserved. So far as is known, this is the first time that such kiva paintings have ever been found in an open, unprotected site. These decorations consist of two bands of step designs painted with a white pigment of gypsum on the natural-brown adobe plaster. Preservation of this bit of ancient art was difficult, but finally eight coats of colorless varnish were applied. A complete set of photographs and measurements was obtained, so that at any time a replica of the entire design could be made, even if the original were destroyed. It was impossible to remove any of this painted plaster. Therefore, to protect it from vandals and the elements, the kiva was refilled with dirt to a depth of about fourteen feet.

Excavations were then continued in the dwelling rooms, eleven of which were completely cleaned out. These rooms measured on

the average twenty feet in length, ten feet in width, and fourteen feet in depth. In several of the rooms pottery caches were discovered.

The excavations of last year were confined to one portion of the pueblo. As a result it had been assumed that the Lowry ruin was the work of one people, known as the Mesa Verde people. This year, however, the excavations revealed the fact that the rooms unearthed in 1930 represented a late addition to and reoccupation of the pueblo, and that the major part of the ruin is of a type known as Chaco Canyon. The center of the Chaco Canyon culture is located in the upper drainage of the San Juan River in New Mexico, two hundred miles southeast of the Lowry ruin. The discovery of this Chaco colony in Colorado may make it necessary to revise some of the current theories regarding Southwest archaeology.

In addition to the work above described, three more kivas were excavated this year, and a fourth was discovered. One of these was decorated with mural paintings. Also, the Great Kiva of the Lowry ruin was trenched from east to west. The internal construction of this is similar to the Great Kiva at Aztec, New Mexico.

It is now possible to trace five different periods of building activity in the Lowry ruin and at least seven separate occupations. Further digging may make it necessary to add to this estimate.

Complete ground plans and cross sections of buildings were carefully made in the field. Drawings were made of designs on all potsherds, and records were kept of their location in the stratigraphic sequence. Several sketches were made to show the Lowry pueblo as it probably looked in its prime. Fragments of ten wooden roof beams were recovered, from which it is hoped a chronology of the buildings may be obtained. One hundred and eight negatives showing all phases of the work and much detail of masonry were taken, and twelve hundred feet of motion picture film were exposed.

The results of this season's work are both novel and interesting. At the end of last season's excavations it was not expected that the Lowry pueblo would turn out to be a Chaco colony; and certainly it was never imagined hitherto that the Chaco influence had penetrated to such a distance. Much of the pottery exhibits Chaco affinities, and most of it is of a type which cannot, at present, be correlated exactly with any other. Therefore, this pottery, which is neither true Chaco nor Mesa Verde, will be known as "Lowry," pending further discoveries.



DETAIL OF CARBONIFEROUS FOREST GROUP

Ernest R. Graham Hall (Hall 38)

Showing one of the gigantic primitive dragonflies (*Meganeura monyi*), some of which had a spread of wings of almost thirty inches. Reproduced in Stanley Field Plant Reproduction Laboratories, Department of Botany of the Museum

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Early in the season Dr. A. V. Kidder of the Division of Historical Research, Carnegie Institution, Washington, D.C., visited the camp of the expedition for three days and watched the work in progress.

The Third Marshall Field Archaeological Expedition to British Honduras, under the leadership of Assistant Curator J. Eric Thompson, reached Belize, capital of British Honduras, at the end of February. After a few days spent in outfitting in Belize, Mr. Thompson left by boat for the town of Orange Walk, situated on the New River in the north of the colony. Thence he traveled by motor boat, lumber railroad, and mule to the village of San José in the northern section of the Cayo district with the intention of excavating a group of ruins at Kaxi Uinik, close to the Guatemalan border. Owing to lack of labor and facilities for work this plan proved impracticable, whereupon it was decided to excavate a group of ruins lying some four miles east of the village of San José. This site consists of a ceremonial plaza of the usual Maya type; i.e., it contains one plain stela, and is flanked by a series of mounds the largest of which attain heights of some thirty to forty feet. In addition to this main group there are two smaller units consisting of low house-mounds facing small courts, and a series of scattered mounds and structures, including a ball court used for the ancient Maya ceremonial ball game.

A hut was built, the camp was organized, and shortly excavations began. During Easter week, when the Mayas can hardly be induced to work, Mr. Thompson made a short archaeological reconnaissance trip to Kaxi Uinik and the important sites of Chochkitam and La Honradez in the Peten District of Guatemala. This trip yielded much important information particularly with respect to architectural development.

Despite a severe shortage of labor in the early stages of the work, excavations continued until May except for a short interval when Mr. Thompson, because of an accident, was forced to spend some time away from camp. Owing to the approach of the rainy season, and sickness, work at the San José ruins was stopped in May.

The pyramidal structures were the first scene of operations. One of these proved to be a stone-faced terraced structure, on the summit of which a wooden temple presumably once stood. Of this supposed temple no traces were found, but the sub-structure revealed many architectural details of considerable interest. The stairway on the front (east side) was quite different from those usually encountered on Maya pyramids, for the upper sections of the two top flights

were set within the terraces, instead of against the outside of the terrace walls, as is the usual Maya practice. Stairways of a somewhat similar type have also been reported from Macanxoc and Uaxactun.

In two mounds of the ceremonial group, votive caches containing a number of unusual flints were found. Hitherto Field Museum had not possessed examples of these peculiar objects. These flints have been worked into fantastic designs, some of which undoubtedly represent animals and human beings. The workmanship is in many cases very delicate, and reveals the great mastery the Mayas had over intractable flint.

Many burials were uncovered. In several cases the head of the deceased had been placed in a coarse bowl covered with a second bowl of the same type placed over it in an inverted position. Sometimes the heads apparently were too large for the space, and a piece of the skull was then chopped off. The long bones of the body usually were found accompanying the bowls containing these heads, but in a few cases they were missing entirely.

With the burials were found numerous interesting objects such as pottery vessels, obsidian knives, stone axes, and jade beads. In one burial the associated objects included three oyster pearls, a jade amulet, small jade ear-plugs, a very fine jade necklace, a small jade wristlet, and a hematite disk. The pottery was invariably broken into many pieces. This had usually been done before interment, as pieces of the same pot were frequently dug up several feet apart. One tripod vessel of outstanding merit is carved with a very delicate scene showing seated figures with sweeping quetzal-feather head-dresses holding ceremonial objects in their hands. The designs on this vessel were made by cutting away the soft clay of the background before firing, so that they stand out in low relief. Among other notable objects there are human teeth inlaid with jade disks, and others with lower edges filed across.

All this material appears to belong to the Holmul V period, the culminating point of which was between the seventh and ninth centuries of our era. The culture of San José has much in common with that encountered in the neighborhood of Mountain Cow Water Hole by the First and Second Marshall Field Expeditions to British Honduras. In addition to the collections obtained, much information was gathered as to pottery types and their distribution, as well as data on local developments of architecture and methods of burial.

The Museum is much indebted to the Belize Estate and Produce Company of London for permission to dig on its lands, for much assistance in transport, and for kind aid given in time of sickness. The share of the collected objects belonging to this company, under the terms of the concession, was subsequently purchased from it by the Museum.

It was necessary to spend some time in Belize for the purpose of obtaining permission from the colonial government to export the collections. Operations were then transferred to the republic of Guatemala. There the archaeological collections made by the Carnegie Institution in the Peten District were studied in relation to Field Museum collections from the neighboring regions, including that of the present expedition. Ethnological work was carried on both in Guatemala and British Honduras, and much folklore material was collected.

A survey was made of the western highland region in anticipation of an intensive study to be made of a single community at some future date. After another week in Belize shipment of the collections was completed, and the expedition returned to the United States early in July. Mr. Thompson, on his way back, visited museums in New York and Philadelphia for the purpose of discussing exchanges of Central American material not at present represented in Field Museum collections.

The Field Museum-Oxford University Joint Expedition to Mesopotamia resumed operations at Kish. This, its ninth consecutive season, ran from November 15, 1930, to March 15, 1931. Field Museum's participation in this expedition is sponsored by Mr. Marshall Field. Mr. L. C. Watelin again was director of excavations and was assisted by his son, Mr. René Watelin, and three assistants, among whom is Mr. Robert Van Valzah, Jr., of Chicago. The general supervision of the expedition's activities, as in previous years, was in the hands of Professor Stephen Langdon of Oxford University.

Operations on the great temple area of Kish continued, yielding inscribed tablets, quantities of cylinder seals, and royal tombs at deep levels. Many other tombs were opened, revealing new types of pottery. In one of these was found a chariot, but unfortunately it was in bad condition. Some gold objects were found lying near one of the tombs, testifying that gold circulated freely in the Kish area at an early date. The northwest side of the stage tower was cleared, and also the wide area north of the temple, which exposed

the side of the temple of the Hammurabi period. Important data were secured as to the construction and extent of the grand ziggurat or temple tower of Harsagkalamma. It was ascertained that the great stage tower, constructed about 3000 B.C., lies directly over the old Sumerian city. Beneath its outer western base were found the richest early Sumerian tombs thus far found at Kish. Some of them harbored chariots, skeletal remains of oxen, and harnesses. In the neo-Babylonian temple glazed coffins containing magnificent gold jewelry were brought to light.

Among interesting discoveries is a seal found about thirty feet below the surface of the mound at plain level, bearing an inscription in the style of the seals excavated at Mohenjo Daro and Harappa in the upper Indus Valley. This is the first time that a seal of this Indian type has been found in an early stratum in Mesopotamia. With it was an object bearing a cuneiform inscription of a style that assigns it to a date of about 2800 B.C.

The most interesting event of the season was the unexpected discovery of two Persian palaces of the Sassanian dynasty (A.D. 226–636). A palace building decorated with elaborate sculptures was laid bare within a stone's throw of the expedition's major field of operations. In the fourth century A.D. the power of the Persian kings extended as far as the Euphrates Valley, and they were involved in many wars with the Greek emperors of Byzantium. Hitherto only one palace of the Sassanians had been known in Mesopotamia—that at Ctesiphon near Bagdad. The first of the palaces now revealed at Kish was laid out around a spacious court with a fountain. It was supported by columns of bricks with glazed yellow bases. From the court, doorways led into suites of rooms. The walls and the interior of the doorways were covered with friezes carved in low relief, and with sculptured heads. Fourteen finely modeled busts were recovered in one of the doorways. Some of these may represent kings of the Sassanian dynasty and royal ladies. In one doorway, on each side of the door posts, were twelve heads of women arranged one above the other. There were numerous mural stuccos with floral designs such as pomegranates, lotus, vine and grape, and conventional rosettes, palmettos, and foliage. Others were decorated with animal designs, such as a lion attacking a zebu, a stag led by a chain fastened to its nostrils, and a naturalistic ram's head surrounded by eagle's wings.

The second of the palaces discovered adjoined the first, and consisted mainly of a large nave which may have served as a court

room. This was supported by two rows of pillars. The walls of this palace were decorated like those of the first, and yielded four busts of a crowned and bearded Sassanian king with strong individualistic features. Blue and yellow glazed pottery was found in both palaces.

The importance of these discoveries can hardly be exaggerated, since but little of Sassanian art has survived in Persia proper owing to the ravages of the country by the conquering Arabs. Sassanian art made its influence widely felt in central Asia, and in China under the T'ang dynasty. As the Museum's Chinese collections contain a great deal of material which shows the Persian influence of that epoch, especially in decorative design, the unexpected Persian acquisitions coming from Kish are particularly welcome for comparative studies of art forms and motifs.

Word was received from Professor Langdon that, under the direction of Mr. Watelin, Mr. Gerald Reitlinger of Oxford has conducted excavations at Abu Sudaira, three miles to the east of the main complex of mounds, revealing a large city of the Mongol period (thirteenth to fourteenth century).

During the first half of 1931 Mr. J. Reid Moir successfully continued his excavations, inaugurated during the preceding year, at the brickyards of Bolton and Company near Ipswich, England. Mr. Moir reports that the finished flint implements from the pre-Crag horizon show clearly that their makers had progressed a considerable way on the evolutionary path. These flints belong to the earliest period of human workmanship, and represent an important collection of Pliocene artifacts from beneath the Red Crag of East Anglia. Mr. Moir is at present engaged in preparing a complete report on his excavations, which will be sent to the Museum in due course.

The work of Miss Malvina Hoffman, the sculptor commissioned to model life size figures, busts, and heads of the representative types of the principal human races, made rapid progress during 1931. Her sculptures will be executed in bronze, and will be exhibited in Chauncey Keep Memorial Hall, which is to be devoted to the races of mankind.

In the first part of the year Miss Hoffman worked at her Paris studio and availed herself of the presence of African natives, who had been brought to Paris for the Colonial Exposition, and who served as models for her sculptures. Many of the full length subjects, and also heads and busts, have already been completed in bronze.

During May Miss Hoffman visited museums at Hamburg, Berlin, Munich, Prague, and Vienna, and consulted the most eminent anthropological authorities in these cities to familiarize herself with the characteristic traits of European racial types. She was received everywhere with great cordiality, and her requests for information and photographs met with hearty response and many helpful suggestions. In Vienna Miss Hoffman studied a new method of casting in a material known as hominite.

After spending a week in Field Museum in consultation with the staff of the Department of Anthropology, Miss Hoffman sailed from San Francisco on October 2 for the Far East. She spent the month of October in Hawaii, November in Japan, and December in the capital of China.

The Bishop Museum of Honolulu accorded her full cooperation. The chief result of her work in Hawaii is a life size portrait head of a Hawaiian and another of a Samoan youth, from whom also a sample of his wavy hair was obtained; also a life size drawing in sanguine of a Samoan chief.

At Tokyo Miss Hoffman modeled life size heads of a Japanese man and woman. While in Japan she was the recipient of courtesies from Count Hirotaro Hayashi, member of the House of Peers and professor of pedagogy in the Imperial University of Tokyo, and many other officials and scholars.

From Tokyo she went to Tomakomai on the island of Yezo, the home of the Ainu. With the assistance of Miss Yae Batchelor, an Ainu and adopted daughter of Mr. John Batchelor, the famous eighty-eight-year-old missionary, who has spent almost his entire life among the Ainus, Miss Hoffman succeeded in obtaining as subjects for study a typical old Ainu man and a middle-aged Ainu woman and taking all necessary data, measurements, and photographs. These, with a model she made of a male Ainu head, will enable her to make a full-length statue of an Ainu. As additional data, many still and motion pictures were taken of Ainus of all ages from a number of villages.

Thanks to the courtesy of Dr. Davidson Black, Miss Hoffman was permitted to make her headquarters in the Peking Union Medical College, one of the Rockefeller foundations at Peiping, China. Miss Hoffman made casts of two Chinese skulls showing the greatest contrast in bone construction, and completed the life size heads of a northern Chinese and a Manchu. A riksha coolie was photographed between the shafts of his carriage in characteristic action, and casts

of his hands on the shafts were made. A venerable Chinese artist consented to pose with his paint brush in his right hand, of which she made a negocoll cast. This was very difficult owing to the position of the fingers, but the cast is reported as being perfect. Numerous photographs were taken of both men and women, the most prominent persons being the Living Buddha of Outer Mongolia and his secretary, a Mongol Lama of high rank. Miss Hoffman left China on the first of January to proceed to Bali, Java, Sumatra, the Andamans, and India.

Much research work was performed by members of the Department of Anthropology, and the large number of publications turned out this year is especially gratifying. Mr. Ernest Mackay's *Report on Excavations at Jemdet Nasr* (Field Museum-Oxford University Joint Expedition to Mesopotamia) was published, completing the first volume of the Anthropology Memoirs of which it constitutes the third number. It is provided with an index covering the entire volume. This report is of interest to archaeologists in general in that it deals with the painted pottery of Jemdet Nasr. As painted pottery of this type has been found in recent years distributed over a vast area, it presents an interesting problem that has aroused much discussion.

Professor Roy L. Moodie's *Roentgenologic Studies of Egyptian and Peruvian Mummies* was issued as the third volume of the Anthropology Memoirs. This study is based on roentgenograms of mummies most of which are in the Museum's collections. The x-ray work was done, for the most part, by the Museum's Division of Roentgenology.

Curator Berthold Laufer is author of a paper, published by the Museum, on *The Domestication of the Cormorant in China and Japan*—the first of a series dealing with animal domestications in Asia. Dr. J. Alden Mason, formerly on the staff of the Department and now connected with the Museum of the University of Pennsylvania in Philadelphia, prepared the first part of a report on his excavations in Colombia carried on in 1922, and this was published by Field Museum Press. An archaeological report by Assistant Curator J. Eric Thompson on the work of the Marshall Field Archaeological Expeditions to British Honduras, and a paper on *Serpent Worship in Africa* by Assistant Curator Wilfrid D. Hambly, were also published. *Carved and Painted Designs from New Guinea* by Assistant Curator Albert B. Lewis, illustrated by fifty-two plates, forms No. 5 of the

Anthropological Design Series and was issued in the beginning of the year.

A report on the work in Angola, Africa, of the Frederick H. Rawson-Field Museum Ethnological Expedition to West Africa, prepared by Assistant Curator Hambly, leader of the expedition, is now in press. The manuscript of Mr. Hambly's report on the same expedition's work in Nigeria is almost completed. Dr. Ralph Linton completed his work on the ethnology of the Tanala, based on the results of the Marshall Field Anthropological Expedition to Madagascar (1925-27), and this publication is now in press. A handbook on the *Ethnology of Melanesia*, written by Assistant Curator Lewis, is now in press and will be issued as Part 5 of the Museum's series of guide books.

Mr. Rowland Rathbun, Assistant Professor of the History of Architecture at Armour Institute, Chicago, has begun a study of the plan and structure of the Sassanian palaces discovered at Kish and submits the following preliminary report: "The fragments of bas-reliefs from the two Sassanian palaces at Kish thus far received have been sorted as to locations in the palaces and as to decorative motives. Many of these fragments are being pieced together and repaired. Restorational drawings are being made of the plans and interior rooms from these sculptured examples. Upon reviewing this material one is greatly impressed by the extreme variety of patterns and the character in which they are executed. The balance of these fragments expected next year will fill in many of the missing pieces needed for a more complete restoration of these two palaces."

BOTANY.—During 1931 no expeditions were conducted by the Department of Botany for the purpose of obtaining exhibition or study material. However, the work of photographing historic type specimens of tropical American plants in European herbaria, under a generous grant of funds made for the purpose by the Rockefeller Foundation, was continued by Assistant Curator J. Francis Macbride, who has been engaged in this task since the summer of 1929.

Excellent progress may now be reported in the prosecution of this important undertaking. There have been prepared during the past three years approximately 18,500 negatives illustrating type or other historic specimens of American plants, a series whose value for study purposes scarcely can be overestimated. Prints from these negatives, when distributed into a herbarium, facilitate the work of determination to an astonishing degree. They add to any American

herbarium representation of thousands of species confined hitherto to the larger European herbaria, and therefore formerly studied in American herbaria only through the original descriptions.

Many of the early descriptions of American plants are annoyingly deficient, and so brief that they fail to mention many of the characters now considered important by systematic botanists. The photographs are often nearly as good for study purposes as the specimens themselves. In consulting the prints as they are filed in the Herbarium of Field Museum, ordinarily a mere glance is sufficient to give a definite idea of the plant represented. Thus the species illustrated may be excluded from further consideration, without the necessity of searching out and reading the original description.

Mr. Macbride has spent the greater part of his time at the extraordinarily rich herbarium of the Botanical Museum at Berlin-Dahlem, Germany, and he has now practically completed the photographing of the South American types in that collection. The work, therefore, will be extended to other institutions possessing important collections of South American plants.

In 1930 many types of the Munich Herbarium, particularly those of the Martius Brazilian herbarium and others studied by the late Dr. Ludwig Radlkofer, were photographed. In the winter of 1930-31 Mr. Macbride spent several weeks at Geneva, Switzerland. There he obtained photographs of South American types in the DeCandolle Herbarium, one of the most famous and most important of all the herbaria in the world, because it was the basis of the first serious attempt to publish a flora of the whole earth. Since specimens of this collection never are lent, photographs of them are extremely desirable not only for American herbaria but almost equally so for those of Europe.

Mr. Macbride also photographed certain types of the Delessert Herbarium, maintained by the city of Geneva, with which the DeCandolle Herbarium is housed. In his work at the Conservatory and Botanic Garden he was extended every possible assistance through the unfailing courtesy of Dr. John Isaac Briquet, whose recent untimely death is mourned by botanists the world over, many of whom had enjoyed his hospitality and kindness.

Other types were photographed at the Boissier Herbarium of the University of Geneva, which likewise contains important collections of South American plants, particularly the extensive Hassler series from Paraguay. At the university the success of Mr. Macbride's work was due largely to the sympathetic reception that he received

from Dr. Robert Chodat, the well-known monographer of the family Polygalaceae.

The completion of the task of photographing the Berlin types represents an immense amount of labor that has been well and faithfully accomplished. It is not to be assumed that every tropical American type in this vast herbarium has been photographed. Certain groups have been omitted purposely, since the plants belonging to them are of such a nature—species based usually upon minute or microscopic characters—that photographs of them would have little value for determinative or descriptive work.

The superior quality of the photographs thus far obtained is attested to by all competent persons who have examined them. As a result of the care exercised the specimens are reproduced with unusual fidelity to detail. To those engaged in monographic work, who are unable to visit personally the European herbaria, they are indispensable. There has been a gratifying demand upon the part of North and South American institutions for prints of these type negatives; indeed, a desire for them has been almost unanimous among the institutions approached, the only obstacle to the distribution of a large number of sets being financial difficulties upon the part of the herbaria concerned. Under improved economic conditions there should be a large demand. The prints, of course, are being offered for sale at the mere cost of making them.

As it is, complete or partial sets of the prints, so far as they have become available, have been supplied through sale or exchange to five of the principal herbaria of the United States. A complete set of prints from the negatives obtained at Geneva has been deposited in the Berlin herbarium. At Field Museum prints have been made from the negatives as rapidly as possible, and mounted and distributed into the Herbarium. Here they are available to any visiting botanist.

It would be amiss to record the completion of the work at Berlin without mentioning the unfailing consideration of the Director, Dr. Ludwig Diels, and the members of his staff, who patiently and conscientiously have contributed to the success of this long task. Their continued courtesy is deeply appreciated by Field Museum.

Through the year constant use of the Museum Herbarium has been made by members of the staff of the Department of Botany and by visitors to the Museum. During 1931 there were published at least thirty-three papers based wholly or in part upon the collections—probably the number is greater, since it is almost certain

that some papers by outside writers have not come to the attention of the Museum. The majority of these papers were written by members of the staff, but others were prepared by persons who had borrowed material for study.

During 1931 Associate Curator Paul C. Standley published twenty papers based more or less directly upon collections in the Museum Herbarium. The largest of these was Volume X of the Botanical Series of Field Museum, devoted to *Flora of the Lacatilla Valley, Honduras*. This publication consists of 418 pages of descriptive text, accompanied by sixty-eight photogravure plates illustrating scenery and plants of the northern coast of Honduras. It is based upon collections made by the author about the port of Tela during the winter of 1927-28, and contains brief descriptions of the plants found there, with notes regarding their local uses and their vernacular names. The introduction describes the more prominent general features of the vegetation. The volume is the first complete descriptive flora ever published for any part of Central America.

A paper of fifty-six pages, written by Mr. Standley and published by Field Museum, is devoted to *The Cyperaceae of Central America*, being an account of the sedges native to the area treated. He is the author also of three parts of Volume VII of the Botanical Series of Field Museum, all devoted to plants of the family Rubiaceae, the group containing coffee, madder, and the cinchona or quinine-producing trees. These parts deal respectively with *The Rubiaceae of Ecuador*, *The Rubiaceae of Bolivia*, and *The Rubiaceae of Venezuela*, each paper being a complete enumeration of the plants of the family known from the country covered. These three papers, with one upon the same group as represented in Colombia that was published in 1930, complete Volume VII, which consists wholly of studies upon this group of plants. The volume contains descriptions of a large number of new species found in the collections made recently in South America by North American collectors, or in older series from European herbaria that were lent for study by the institutions possessing them.

In *Tropical Woods*, the periodical published under the editorship of Professor Samuel J. Record of the School of Forestry of Yale University, who is also Associate in Wood Technology of Field Museum, Mr. Standley published three brief papers: one describing *Talisia Floresii*, a new fruit tree of the soapberry family discovered in Yucatan by Dr. Román S. Flores; another entitled "Two New Trees from South America"; and a third upon "Vernacular Names

of Sinaloa Trees Collected by J. G. Ortega." In *Science* for March 6, 1931, he published brief obituary notices and appreciations of Dr. Ignatius Urban of Berlin-Dahlem, one of the most eminent and most beloved of German botanists, and of Dr. Erik L. Ekman, a Swedish botanist whose exploration in Cuba and Haiti during the past few years has revealed an abundance of new species whose existence there scarcely had been suspected. Dr. Ekman's collections are represented in a gratifying manner in the Museum Herbarium, through large series of duplicates of them received from the Naturhistoriska Riksmuseet of Stockholm.

Other Field Museum contributions to *Tropical Woods* were "The Forests of Northeastern Peru" and "The Occurrence of Walnut in Northeastern Peru" by Mr. Llewelyn Williams, Assistant in Wood Technology, both based on observations made by him during his work as a member of the Marshall Field Botanical Expedition to the Amazon in 1929-30. There also appeared in this publication some reviews of recent Brazilian botanical literature by Acting Curator B. E. Dahlgren.

A paper by Associate Curator Standley appeared in *Unifruitco* for July, 1931, and was entitled "The Debt of Natural History to the United Fruit Company." It dealt with the generous cooperation of that American corporation in scientific exploration and study in Central America and other parts of the tropics.

The third number of Volume XI of the Botanical Series of Field Museum consists of two papers by Mr. Standley, entitled *The Nyctaginaceae of Northwestern South America*, and *The Chenopodiaceae of Northwestern South America*. The former describes all the members of the four-o'clock family that are known to occur in Venezuela, Colombia, Ecuador, and Bolivia, and the second the plants of the pigweed family that grow in the same countries. These papers, like the one upon the sedges of Central America, are not monographic in treatment, but are intended to serve as aids to the determination of material collected in the regions covered.

Mr. Standley published as No. 5 of Volume VIII of the Botanical Series of Field Museum a paper entitled *Studies of American Plants*—V. This consists largely of descriptions of new plants of the family Rubiaceae that were detected during the study of a large number of plants received during the year by the Museum, either on loan or for its permanent collections.

During the year Assistant Curator Macbride published two papers as Nos. 1 and 2 of Volume XI of the Botanical Series—*Spermato-*

phytes, Mostly Peruvian—III, and *Spermatophytes, Mostly Peruvian—IV*. These are devoted chiefly to descriptions of important new species of Peruvian plants discovered by the various Marshall Field expeditions of Field Museum to Peru in recent years.

A large quantity of miscellaneous palm material has in the course of years been accumulated in the Museum, especially in the economic and exhibition collections. Efforts to reduce this to order and to determine unidentified material led first to a card index of the collections, and later to a list of genera and species with common names, in which corrections were made from time to time in accordance with changes in the synonymy. Begun years ago, this was carried on intermittently with slight promise of reaching completion to any definite date until recently, when Field Museum, with the financial assistance of the Rockefeller Foundation, undertook the task of obtaining photographs of type specimens of tropical American plants in foreign herbaria. In this connection the desirability of a complete check list of species of American palms, with indication of the type collections to be photographed, became evident. This prompted some intensive work, with a checking of all references on the American part of the list and as a result an *Index to New World Palms*, by Acting Curator B. E. Dahlgren and Mr. José Frambach, will be published as No. 1 of Volume XIII of the Field Museum Botanical Series.

The *Bulletin of the Pan American Union* in its June issue carried an illustrated article by Mr. Williams entitled "East of the Andes." The account deals with the principal commodities exported from that vast and largely undeveloped territory. The writer also traces the development of aviation and lumbering in those regions during recent years.

A similar article by Mr. Williams appeared in the March issue of the *Pan-American Magazine*. In this article the author set forth his impressions of the montaña or forest region of Peru.

For the *Journal of Forestry*, Mr. Williams prepared an article on "Woods and Forest Botany at Field Museum of Natural History." In this paper he traces the history of the Museum's collection of North American woods and describes the manner in which the specimens have been secured and the present method of displaying them. A brief description of the installations in the Hall of Foreign Woods is followed by an account of other activities, such as expeditions and researches of the Museum in their bearing on forestry.

Of papers issued by botanists of other institutions, several of importance contain mention of Field Museum material. Most important, perhaps, is one by Dr. H. A. Gleason of the New York Botanical Garden, appearing in the April number of the *Bulletin of the Torrey Botanical Club*. This paper of forty-eight pages, entitled "Recent Collections of Melastomataceae from Peru and Amazonian Brazil," enumerates the plants of this important tropical family obtained by Mr. Williams for Field Museum during the course of his explorations in Amazonian Peru.

Mr. Ellsworth P. Killip of the United States National Museum published in the *Journal of the Washington Academy of Sciences*, Volume 21, No. 15, a paper entitled "New Plants Mainly from Western South America—III," in which he described a new passion-flower, *Passiflora loretensis*, based upon specimens collected in the department of Loreto, Peru, by Mr. Williams; also *Valeriana oligodonta*, the type of which is a Peruvian specimen in the Field Museum Herbarium presented by Professor Fortunato L. Herrera. Mr. Emery C. Leonard of the same museum published in the *Journal of the Washington Academy of Sciences* a paper upon "The Genus *Mendoncia* in Peru." In his account of this group of the acanthus family various collections from Field Museum expeditions were cited.

Dr. S. F. Blake of the United States Department of Agriculture published in the *Proceedings of the Biological Society of Washington* a paper with the title "Six New South American Species of *Verbesina*." Two of the species that he describes are based upon material collected for Field Museum in Peru by Dr. August Weberbauer. Mrs. Eva M. Fling Roush of the Arnold Arboretum in her "Synopsis of *Robinsonella*," in Volume XII of the *Journal of the Arnold Arboretum*, lists the specimens of this genus that exist in the Field Museum Herbarium. This genus of the mallow family is confined to Mexico and Central America, and is remarkable for the great beauty of the trees composing it.

Rev. F. E. Wimmer, the well-known authority upon the lobelia family, in a paper published in the *Repertorium specierum novarum*, Volume 29, described a new species from Costa Rica, *Burmeistera obtusifolia*, based upon a specimen in the Herbarium of Field Museum.

In naming the large series of specimens sent him for study at Berlin, Assistant Curator Macbride has had the kind assistance of some of the specialists on the staff of the Berlin Museum. Mr. M. Burret has determined some of the palms, and in a recent paper upon American palms in the *Notizblatt* of the Berlin Garden he

has described two new ones, *Geonoma comptoneura* and *Taenianthera oligosticha*, collected in the department of Loreto, Peru, for Field Museum by Mr. Williams. Dr. Reinhard Knuth of the Berlin staff has described in Volume 29 of the *Repertorium specierum novarum* a plant of the yam family, *Dioscorea quispicanchensis*, collected for Field Museum in Peru by Dr. Weberbauer.

The extensive collections of plant specimens received during the year have so fully occupied the staff of the Herbarium that at times it has been difficult to care for all of them promptly. Their preparation for study, labeling in many instances, mounting, and distribution into the Herbarium have required constant attention. Even more exacting was the task of determining many thousands of them in order that they might be distributed into their proper places in the Herbarium. Nevertheless all specimens received have been given reasonably prompt attention. The only work in arrears is the mounting, and this is largely a legacy from former years.

There have been submitted to the Museum Herbarium for critical determination 163 lots of plants of which a record was kept, and these comprised 11,186 specimens, an impressive total. The material was received from individuals and institutions in all parts of the United States and Alaska. Of the foreign countries from which material was sent for determination, either on loan or for permanent preservation in the Herbarium, there may be mentioned Germany, Sweden, France, Union of Socialistic Soviet Republics, Switzerland, England, Denmark, Japan, Hawaii, Argentina, Brazil, Peru, Ecuador, Colombia, Venezuela, Trinidad, Cuba, Panama, Costa Rica, Salvador, Guatemala, and Mexico.

Many fresh plants from the Chicago region were identified for a large number of persons who brought them to the Museum or forwarded them by mail. Since in most instances these specimens were not preserved, no statistical account of them can be furnished. They were submitted chiefly by teachers and students, or by individuals particularly interested in local natural history. It might be remarked that while most of the plants received in this manner are common ones of no value for permanent preservation, there often are acquired plants extremely rare or not previously recorded in the area, and these furnish data of value for a record of the local flora. There have been identified, also, a large number of plants received by the General Biological Supply House of Chicago from its correspondents in all parts of the United States.

Much of the material received for determination in 1931, especially in the case of collections submitted on loan, consisted of tropical American Rubiaceae. Since this material had not been identified previously, study of it disclosed a substantial number of new species, and specimens that illustrated important extensions of distribution for species already described. The new information thus brought to light has been made the basis of several papers by Associate Curator Standley, already published or in press, upon the Rubiaceae of South America and other parts of tropical America.

The largest collection studied and determined during the year consisted of 1,348 specimens of Rubiaceae from the Delessert Herbarium of the Conservatory and Botanic Garden of Geneva, Switzerland. It comprised all the tropical American material of the first part of the family in that herbarium, and, although most of the specimens already had been named, they were sent for critical revision. Its packing and shipment required a large amount of labor, for which Field Museum is greatly indebted to the courtesy of the late Dr. John Isaac Briquet. The shipment was rich in collections of early botanical explorers, such as Ruiz and Pavón in Peru, and contained numerous historic specimens that were photographed before they were returned to Geneva. It included also many species of which no authentic material had been examined previously, and thus made possible a more critical revision of the determinations of the Museum collections.

A shipment of Rubiaceae almost equally extensive was received on loan from the Museum of Natural History of Paris. This sending of 1,226 specimens consisted of undetermined tropical American material from the vast Paris Herbarium, some of which was collected more than a century and a half ago. Especially valuable was the great number of Venezuelan plants, particularly those obtained along the Orinoco by the French explorer Chaffanjon, who ascended that river almost to its source. The Paris series contained hundreds of Brazilian plants from pioneer collections such as those made by Saint-Hilaire, Gay, Weddell, and Goudot. Even more welcome were the plants of Funck and Schlim, Triana, and Linden from Colombia and Venezuela. The Brazilian collections mentioned were for the most part not available to the compilers of the *Flora Brasiliensis*, and they contained a surprisingly large number of species not reported for the Brazilian flora in that exhaustive monograph.

Through the courtesy of Dr. Gunnar Samuelsson there arrived from the Naturhistoriska Riksmuseet of Stockholm two loans total-



RESTORATION OF A GROUP OF TITANOTHERES (*Brontops robustus*)

Ernest R. Graham Hall (Hall 38)

Gift of Ernest R. Graham. Frederick Blaschke, Sculptor. Background by Charles A. Corwin

Height of large male, eight feet, seven inches; length, thirteen feet, eight inches

UNIVERSITY OF MICHIGAN

ing 651 specimens, chiefly of South American Rubiaceae. While they included many unusual plants obtained by older collectors, such as Mosén and Regnell, they were more remarkable for the collections of recent explorers, notably Dusén and Malme who collected in southern Brazil. These collections yielded an unexpectedly large number of species that had not been known to earlier students of the family.

An important loan from the Royal Botanic Gardens, Kew, England, submitted by the Director, Sir Arthur W. Hill, contained 737 mounted sheets, principally of South American plants of the same family. The Kew collections were interesting on account of the many specimens obtained almost a hundred years ago in Brazil by Gardner and Burchell, as well as for those obtained later in the same country by Glaziou and Ule, and for the plants collected in the Amazon Valley by Traill and Weir. There were also specimens of the incomparable collection made along the Amazon and its tributaries by Richard Spruce, who was the first to explore intensively that inexhaustible region. Although Spruce's series always have been a desideratum among monographers of plant groups, some of them still await study, and they are rich in rare or unnamed species, since regions that he visited never have been reached by recent collectors. The Kew sending included a few exceptionally interesting plants from the state of Tabasco, discovered by J. N. Rovirosa, the only collector who has worked in that remote part of Mexico.

From the Jardin Botanique Principal of Leningrad there were received on loan for determination 766 sheets of American plants, chiefly Mexican. These represented the work of some of the earliest botanists who visited Mexico, and while most of the collections had been determined previously in other herbaria, there was a notable exception in the plants gathered by Karwinsky. His admirably annotated series is represented but meagerly elsewhere than at Leningrad, and it was found to contain several plants new to the Mexican flora, in addition to material of many rare species.

From the University Botanic Museum of Copenhagen, through the kindness of Dr. Carl Christensen, there were lent for study 178 specimens from Mexico and Central America obtained by the celebrated collectors, Oersted and Liebmann. The latter assembled in Mexico probably the largest number of herbarium specimens ever collected there by any one man. Oersted was the pioneer collector in Costa Rica and Nicaragua. Dr. Christensen generously permitted

Field Museum to retain fragments of some of the more ample specimens, and thus there was added to the Herbarium a representation of several species of Mexican and Central American plants previously lacking.

In the case of all the collections mentioned, the more interesting specimens were photographed in the Museum. The photographs thus obtained form a valuable addition to the study collections, and also are available for exchange with other herbaria.

The Arnold Arboretum of Harvard University submitted for determination 143 sheets of Rubiaceae from various parts of tropical America. The majority of them were collected in Cuba.

Associate Curator Standley devoted much time to critical determination of these various collections of American Rubiaceae, and included part of the information obtained from their study in his paper upon *The Rubiaceae of Venezuela* which was published during the year. Descriptions of many of the new species from other countries appeared in *Studies of American Plants—V*, issued in June, 1931, and others are included in a similar paper now in press.

Much of the most valuable herbarium material acquired by the Museum each year is received in return for determinations supplied for the plants. During 1931 several particularly valuable lots were secured in this manner.

The past twelve months have seen unprecedented botanical activity on Barro Colorado Island in Gatun Lake in the Canal Zone, where there is maintained the laboratory of the Institute for Research in Tropical America, to which Field Museum is a contributor of funds. Several botanists visited the island in 1931, and obtained there ample series of specimens. Dr. L. H. Bailey of Ithaca, New York, and his daughter, Miss Ethel Zoe Bailey, presented to Field Museum 250 desirable specimens which they collected on Barro Colorado during the summer, and submitted an equal number of others that were named and returned. Professor C. L. Wilson of Dartmouth College, Hanover, New Hampshire, presented an interesting series of 135 numbers of the island plants. From Mr. James Zetek, the Curator of the Barro Colorado laboratory, there have been received several collections obtained during the late summer and early winter, amounting in all to 928 well-prepared specimens of plants. These were made by several collectors who have visited the island lately. Besides those retained by Field Museum, there were returned to Mr. Zetek a large number of duplicate specimens to be used in forming a herbarium on Barro

Colorado Island. Such a reference collection will now be available to the increasing number of scientists who visit the laboratory each year to conduct research in the several branches of natural science.

The most noteworthy part of the sendings made by Mr. Zetek consisted of plants from a native Panamanian collector, Mr. Silvestre Aviles, whose intimate knowledge of the forest has enabled him to discover a large number of rare plants that had escaped eyes not so well trained to the details of the forest.

As a result of recent collecting on Barro Colorado Island, the list of the known flora has been greatly extended, until it now amounts to almost a thousand species, a remarkable record for an area of only six square miles. Mr. Standley has published three lists of Barro Colorado plants, one of them in Volume IV of the Botanical Series of Field Museum. There is now being prepared a paper listing the recent additions and describing several new species, which will be published early in the coming year.

Another large collection of plants determined during 1931 consisted of 576 specimens collected in 1930 in the Sierra de San Carlos, Tamaulipas, Mexico, by Professor H. H. Bartlett of the University of Michigan. This remote rocky range never had been visited previously by a botanical collector. Consequently, taking into consideration the fact that these isolated mountains of the desert regions almost always possess endemic species, it was not surprising to find that this collection contained a substantial number of plants new to the Mexican flora. It included also several plants that had not before been found so far north in Mexico, and, rather surprisingly, others from the United States whose existence in Mexico had not been suspected.

Two important lots of British Honduras plants were received for determination during the year. One consisted of 147 specimens made in the northern part of the colony by Mr. William C. Meyer of Columbia University in connection with his work upon chicle-producing plants. The other contained 155 numbers collected in southern British Honduras by Mr. William A. Schipp. Like Mr. Schipp's collections of previous years, this sending contained a high percentage of unusual or new plants. Some of those collected in the pine woods that characterize the region are reminiscent of the flora of the pinelands of southern Florida. Particularly is this true in the case of the rather numerous *Utricularias* or bladderworts—small, curiously constructed plants that grow in water or in wet soil.

There were determined sixty-three plants sent from the republic of Salvador by Dr. Salvador Calderón, whose diligent labors in that country have resulted in the compilation of much information regarding its varied flora. Mr. C. H. Lankester of Cartago, Costa Rica, submitted eighty-one specimens of the rarer Costa Rican plants, including material of the recently described *Ruychia phylladenia*, collected on his property. This is an epiphytic woody plant of the Marcgravia family.

For the Companhia Ford Industrial do Brasil there were determined 228 specimens, many of which were important fiber plants now being tested at that company's plantations on the Amazon River with a view to ascertaining their commercial possibilities. There was named at Field Museum also a portion of the collection made by Mr. Guillermo Klug in Peru and Colombia, along the Putumayo River. The expedition made by Mr. Klug along this stream of notorious reputation is valuable because it serves to connect the floras of Colombia and Peru. He seems to possess an exceptionally keen eye for detecting the unusual among plants, and all his collections from the eastern Andean region have given most satisfactory results when studied.

Two hundred numbers of Mexican plants were determined for Mr. Jesús González Ortega, an engineer of Mazatlán, Mexico. These are a continuation of Mr. González's collections of former years, which amount to several thousand numbers of well-prepared plant specimens. Although Sinaloa is not one of the least explored of Mexican states, his work has established the occurrence there of hundreds of plants overlooked by less capable collectors. Another Mexican collection, presented to the Museum in return for determination, consisted of 135 specimens gathered by Mr. H. W. von Rozynski in the vicinity of Jaumave, Mexico. Although small, this collection contained one new species, and in the comparatively well-worked north Mexican flora new species are now rather infrequent.

There were determined for Mr. George L. Fisher of Houston, Texas, 221 numbers of plants which he had collected in various parts of Texas and in southern New Mexico. Assistance was given also in the determination of forty-eight plants received from Dr. Rudolf Probst of Langendorf, Switzerland. These were collected in waste ground in Switzerland, and consisted largely of North American plants the seeds of which had been imported by accident with wool from the United States.



NORTH AMERICAN GEESSE AND SWANS

(Hall 74)

Taxidermy by Ashley Hine

About one twentieth actual size

THE
LIBRARY
OF THE
MUSEUM OF
ART AND
ARCHITECTURE
NEW YORK

Associate Curator Standley prepared for the *Flora of Peru* a treatment of the families Chenopodiaceae and Amaranthaceae. In connection with this work there were prepared accounts of the same families as they are represented in Bolivia, Ecuador, Colombia, and Venezuela. A short paper enumerating the Chenopodiaceae already has been published in the Botanical Series of Field Museum, under the title *The Chenopodiaceae of Northwestern South America*. A paper treating the Amaranthaceae is ready for the press. Work upon these two groups was aided substantially by a loan from the United States National Museum of 679 sheets of South American plants. This loan was made through the courtesy of Dr. William R. Maxon and Mr. Ellsworth P. Killip.

By working long hours outside the customary scheduled ones, Assistant Curator Macbride has completed the first installment of the *Flora of Peru*, upon which he has been engaged for several years through field exploration and herbarium study. The first part of the proposed flora, covering the early families of the usual sequence of flowering plants up to the Orchidaceae, has been submitted for printing. It will form by itself a fair-sized volume, which will be of the highest value to all students of the Andean vegetation. The *Flora* is a descriptive one, containing an account of all the families, genera, and species known to occur in Peru, with keys for their recognition. The account of the grasses has been compiled by Associate Curator Standley. The treatment of the bromeliads or Bromeliaceae, the pineapple family so lavishly represented in Peru, has been contributed by Dr. Lyman B. Smith of the Gray Herbarium of Harvard University; that of the highly ornamental plants of the genus *Bomarea* of the family Amaryllidaceae by Mr. Ellsworth P. Killip of the United States National Museum.

During the year Mr. Macbride prepared various papers dealing with rare Peruvian plants collected by the several Museum expeditions to Peru, under Mr. Macbride, Mr. Williams, and Dr. Weberbauer. He also studied some of the early and historically important Peruvian collections which are preserved in the herbaria of Berlin and Geneva.

Mr. Hermann C. Benke of Chicago has devoted some of his time to study of Mississippi Valley plants in the Museum Herbarium. He has determined, also, portions of his own extensive collections of United States plants which he has contributed so generously from time to time to the Herbarium.

The numerous reconstructions of fossil plants which compose the Carboniferous swamp forest group completed during the year for the historical geology exhibits in Ernest R. Graham Hall, were prepared in the Stanley Field Plant Reproduction Laboratories in the Department of Botany. The planning and the scientific responsibility for the paleontological reconstructions, botanical and zoological, devolved on the Acting Curator of Botany who throughout the course of the work enjoyed the generous cooperation of Professor A. C. Noé, the paleobotanist of the University of Chicago. Professor Noé's intimate knowledge of the Pennsylvanian flora was freely placed at the disposal of the Museum. His advice and collaboration in the solution of the many technical paleobotanical questions arising at all stages of the work have contributed greatly to the final success of the undertaking. His readiness to grant to the Museum the loan of specimens from the extensive collections in his care, and his many visits, often accompanied by sections of his classes, to the laboratories of the Department of Botany, furnish an example of the perfect kind of cooperation which at times may be effected between related departments of the Museum and the university.

Details concerning the reconstructions of fossil plants and animals which enter into the Carboniferous forest group will be found in the section of this Report that deals with the new exhibits of the Department of Geology (p. 160). A brief description of the group appeared in *Field Museum News* of October, 1931. A more extended account of it has been prepared by the Acting Curator of Botany for publication in the Museum's Geological Leaflet Series and is now in press.

During 1931 the Department of Botany distributed in exchange 15,641 herbarium specimens and photographs of plants to a large number of institutions and individuals in many parts of the United States and Europe. Through its exchanges with other institutions the Museum receives some of the most valuable herbarium material that it acquires, collections that could not be obtained in any other manner. During the past year the Herbarium has received approximately 11,000 specimens as return exchanges. A large part of the exchange material dispatched from the Museum consisted of duplicate specimens obtained in Peru by the Marshall Field Expeditions, and there were shipped, besides, several sets of the plants gathered in Yucatan by the late Dr. G. F. Gaumer, which formed the basis of the *Flora of Yucatan* published by the Museum in 1930.

Part of the material distributed consisted of duplicate mounted sheets removed from the Herbarium. Years ago there were purchased by the Museum several large private herbaria, all of whose specimens were distributed into the permanent collections. It has been found that these often duplicate one another, and such duplicates are being removed as they are discovered in order to provide needed room in the storage cases.

The loans of mounted sheets from the Herbarium during the past year amounted to 4,815 specimens, sent out in forty-three lots to almost as many institutions and individuals. Of this total, 2,213 represent Peruvian collections sent to Assistant Curator Macbride at Berlin for study and determination in connection with his work upon the flora of Peru. The rest of the material consisted partly of collections that were sent to specialists for identification, but chiefly of loans made to students engaged in monographing limited groups of American plants.

To Dr. Carl Epling of the University of California at Los Angeles, there were lent 624 sheets of *Salvia* from North America, to facilitate his monographic studies of that large genus of the mint family. There were sent to Dr. Francis W. Pennell of the Academy of Natural Sciences of Philadelphia 469 sheets of the family Scrophulariaceae, for use in a detailed account that he is preparing of this family as it is represented in the northwestern United States. To the Philadelphia Academy there were lent also thirty-eight specimens of *Phlox*, for study by Dr. E. T. Wherry of the University of Pennsylvania, who is engaged in monographing this complicated group of United States plants.

There were forwarded to the New York Botanical Garden sixty-three specimens of *Callicarpa*, at the request of Mr. Harold Moldenke, who, after completing his account of the genus *Aegiphila*, for which the Museum material was borrowed, is continuing with this second group of the same family, the Verbenaceae. In this connection should be mentioned the Museum's indebtedness to Mr. Moldenke for his loan of sixty-five negatives of type and other important specimens of the genus *Aegiphila* from American and European herbaria. Prints of these negatives were made in the Museum and are now deposited for reference in the Herbarium.

To the New York Botanical Garden there were lent twenty specimens of the genus *Maieta*, for study by Dr. H. A. Gleason, and 226 Peruvian plants of the family Melastomataceae, including the types of several species described by Assistant Curator Macbride.

Professor M. L. Fernald of the Gray Herbarium of Harvard University received from Field Museum on loan 216 sheets of *Potamogeton* of the United States, the material of a particular group in this genus of pondweeds with the study of which he is engaged. He returned the material carefully annotated, and with unusual promptness.

Another loan of herbarium specimens made during 1931 consisted of thirty-one sheets of the genus *Swertia*, for study at the Missouri Botanical Garden, St. Louis. To Miss Ethel I. Sanborn of the University of Oregon, Eugene, Oregon, thirty-two sheets of American plants were lent for comparison with fossil plants in the study of which she is interested.

Of several sendings of Peruvian plants for study, the largest consisted of 365 sheets of *Piper* and *Peperomia* to Dr. William Trelease of the University of Illinois, who is preparing for the *Flora of Peru* the account of this difficult and complex group of tropical plants. Among the Museum collections of Piperaceae Dr. Trelease has discovered a large number of new species, as was confidently to be expected in a region where so little collecting had been done previously.

Twenty-five specimens of Peruvian plants of the lobelia family were lent to Rev. F. E. Wimmer of Vienna, the well-known monographer of the group. Eighty-seven Polygalaceae were sent to Dr. Robert Chodat of the University of Geneva, Switzerland, who for many years has been publishing monographic accounts of the family.

Fourteen sheets of critical lichen species were lent to Miss Joyce Hedrick of the University of Michigan, who is completing the manual of North American lichens left unfinished by the late Professor Bruce Fink. In addition, there were sent to Miss Hedrick twenty-one photographs of lichens, with a view to their possible use as illustrations in the forthcoming volume.

As in previous years exchanges of hand specimens from the Museum's duplicate collection were made with individuals and institutions interested in the study of woods. To Professor Emanuel Fritz of the University of California the Museum sent 137 specimens of East Indian, Paraguayan, Brazilian and North American woods for study purposes. Yale University School of Forestry received 123 study and exhibition specimens of woods of Brazil, Paraguay, and the United States.

In exchange for material received by the Museum in 1929, 146 hand samples of woods of the United States, Brazil, Paraguay,

India and British Honduras, were sent to the United States National Museum. Specimens of woods for study were sent also to Mr. Alexander L. Howard of London and Dr. Ryoza Kanehira of the Kyushu Imperial University, Fukuoka, Japan, at the suggestion of Dr. John Cameron of Union Medical College, Peiping, China, who visited the Department in the course of the year.

Dr. K. K. Chen, Director of Pharmacologic Research of Eli Lilly and Company, Indianapolis, Indiana, received from the Museum for study and experiment samples of leaves, stems and roots of a malpighiaceae liana, ayahuasca, which occurs in northeastern Peru. A sample of an infusion prepared by the natives from the leaves of this vine was also sent to him.

As usual, the Museum has received appreciated assistance from many botanists of the United States and Europe in the determination of its current collections. While in some instances it has been necessary to lend mounted specimens for naming, in most cases it has been possible to send duplicate specimens to be retained by the recipients as a partial return for their labor in making determinations.

The staff of the Botanical Museum and Garden of Berlin-Dahlem has furnished determinations of a part of the Chinese plants collected by the William V. Kelley-Roosevelts Expedition to Eastern Asia for Field Museum, which were sent to that institution last year. Assistant Curator Macbride writes most appreciatively of the continued assistance he has received from the Berlin staff in determining the extensive collections being studied as a basis for the *Flora of Peru*.

Among those for whose continued aid in the determination of material the Museum is grateful there should be mentioned the following: Professor Oakes Ames of the Botanical Museum of Harvard University, who has identified numerous miscellaneous lots of orchids from tropical America, and now is preparing an account of the orchids of Peru for the Museum's *Flora* of that country; Mr. Edwin B. Bartram, Bushkill, Pennsylvania, who always may be relied upon to name tropical mosses with a gratifying promptness that doubles the Museum's obligation for the favor; Dr. C. W. Dodge of the Farlow Herbarium of Harvard University, who has given assistance with lichens; Dr. William R. Maxon of the United States National Museum, who has been kind in determining many of the tropical ferns received currently; Mr. Ellsworth P. Killip of the same institution, who has named various lots of tropical American plants, especially Passifloraceae, Urticaceae, and Boraginaceae; Dr. B. L. Robinson of the Gray Herbarium of Harvard University, who

has determined Compositae of the Eupatorium alliance; Dr. H. A. Gleason of the New York Botanical Garden, who has determined a large number of plants of the vast family Melastomataceae, that forms so important an element in the flora of Peru; Mr. Albert C. Smith of the same institution, who has named the Museum's collection of South American Ericaceae of the groups in which he is particularly interested; Dr. A. S. Hitchcock of the United States Department of Agriculture, Washington, D.C., who has identified critical specimens of Peruvian grasses; Dr. S. F. Blake of the United States Department of Agriculture, who has supplied names for several difficult collections of Compositae; Dr. William Trelease of the University of Illinois, who has been prompt in furnishing determinations for plants of the family Piperaceae; and Dr. Carl Epling of the University of California at Los Angeles, who has named with equal promptness a large number of plants of the mint family from Peru and elsewhere.

Most of the time of Assistant Curator James B. McNair during the year has been occupied in routine work of accessioning and cataloguing, and in preparations for the installation of exhibits. Nevertheless he has found time to carry on research concerned with the physical and chemical properties of substances formed by plants in relation to climate, the interrelation of chemical compounds in plants, and the identification and quantitative determination of various acids formed by plants, along the lines of his *A Study of Some Characteristics of Vegetable Oils*, published in 1930. Since then he has published similar papers on alkaloids and waxes in the *American Journal of Botany* (Vol. XVIII, pp. 416-424, 518-526). Studies on volatile oils, cyanogenetic glucosides, saponins, carbohydrates, dyestuffs, and proteins were also undertaken by Mr. McNair. He has shown that some of these substances have individual variations which may be correlated with climate, and he has found that all of them apparently have greater potential energy when produced by plant families of temperate climates.

Mr. McNair's study of the interrelation of chemical compounds in plants has been confined thus far to the relationship between oxalate and cyanogen and the relationship between essential oils and resin. It has been shown that the presence of oxalate in plants may be contingent upon the presence of cyanogen, and likewise that resins are formed from some of the constituents of essential oils.

His investigation of acids formed by plants has to date been confined chiefly to the volatile fatty acids produced by fungi. His

typewritten manuscript upon this subject comprises some seven hundred pages.

While the taxonomist identifies plants by their flowers and leaves, the worker in economic botany has his chief analytical problem in the determination of such detached plant products as fibers, gums, resins, oils, sugars, and starches. The chemical and botanical knowledge required for analytical problems in economic botany sometimes proves to be of direct service in other fields. The identification of the textile fibers used at various periods in Egypt indicates not only the progress of the textile art at these periods but also the state of agriculture and international commerce. In connection with studies of the cultural history of Egypt by Dr. T. George Allen, Assistant Curator of Egyptian Archaeology, cotton and linen textiles were identified by Mr. McNair.

Fiber identifications have been useful also in the study of the artifacts left by American aborigines. In the southwestern states there once existed tribes now known as Pueblo Indians and Basket Makers. The places in which they lived may be determined by the artifacts left by them. The Basket Makers antedate the Pueblos and did not use cotton, while the Pueblos did. The simple determination of a fiber as non-cotton for Dr. Paul S. Martin, Assistant Curator of North American Archaeology, thus aided in determining a collection of artifacts from San Juan County in southeastern Utah as belonging to the Basket Makers. In connection with the ethnological researches of Dr. John Alden Mason of the University of Pennsylvania Museum, resins used by the Indians of Colombia, South America, were determined by Assistant Curator McNair as being derived from trees of the bean and myrrh families.

For many years Mr. McNair has been recognized as an authority on poison ivy. Two articles on this subject were written by him during the year; viz. "Ivy Poisoning," for *Collier's Encyclopedia*, and "Ivy Poisoning and Lobinol," which appeared in the *Journal of the American Medical Association*, August 1, 1931, Volume 97, page 341. On the evening of June 25, 1931, Mr. McNair lectured on poison ivy over Radio Station WENR through the courtesy of the National Broadcasting Company.

Mr. Llewelyn Williams, Assistant in Wood Technology, has been engaged in preparing for publication the results of his researches on the woods of northeastern Peru. The specimens studied form a part of the comprehensive collection assembled by the Peruvian

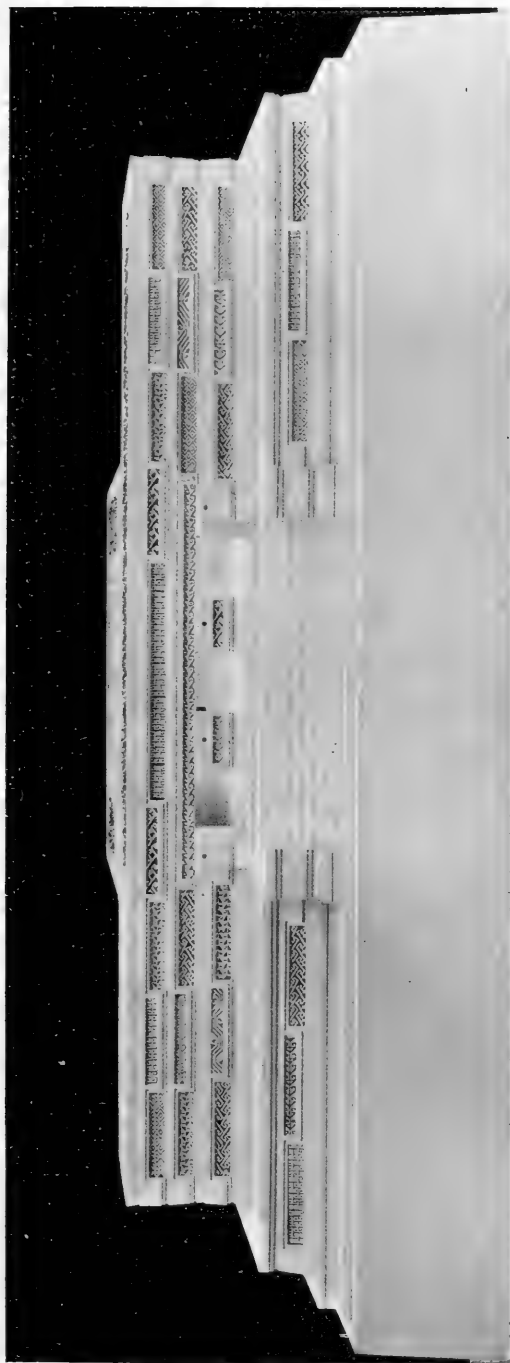
division of the Marshall Field Botanical Expedition to the Amazon, 1929-30.

This year, as in the past, members of the Department were consulted by many scientific institutions, business houses, and individuals upon matters pertaining to botany. Much time is required to supply information asked by correspondents or by visitors, but a thorough effort is always made to answer their questions.

Miss Edith M. Vincent, Librarian of the Department, has devoted a great deal of time to compiling bibliographic information for visitors to the Museum who desired to consult its extensive botanical library. Especially numerous are those who wish to see illustrations of plants. Many of them are artists engaged in illustrating encyclopedias and other reference works. Others examine plant portraits in order to use them for designs and for illustrating advertising matter.

The Department of Botany has enjoyed visits from a large number of botanists of the United States, but foreign visitors have been fewer than in preceding years. Professor H. M. Hall of the Carnegie Institution of Washington visited the Department in January to consult its Herbarium and library. Dr. Francis W. Pennell and Dr. E. T. Wherry of Philadelphia, after a summer of botanical collecting in the northwestern states, spent two days in the Herbarium in the autumn, studying respectively Scrophulariaceae and the genus *Phlox*. Mr. Charles C. Deam of Bluffton, Indiana, spent a few days in the Herbarium, collecting data for one of his intensive reports upon the Indiana flora. Dr. Robert E. Woodson of the Missouri Botanical Garden studied some of the Herbarium collections of the family Apocynaceae, in which he is specializing. Dr. Earl E. Sherff of Chicago Normal College visited the Herbarium almost every week, in order to study the several groups of the family Compositae with whose study he is engaged. A welcome visitor to the Herbarium upon several occasions has been Dr. Th. Just of the University of Notre Dame, who is keenly interested in the flora of the Lake Michigan region, and especially in the family Cyperaceae.

Because of its unique position as a connecting point between the railroads of the east and west, Chicago is visited by many botanists who, although lacking time for work in the Herbarium, nevertheless visit it while waiting for train connections. In this manner, with only an hour or two available, they have an opportunity to become acquainted with the activities of the Department.



MODEL OF A ZAPOTEC PALACE AT MITLA, MEXICO
(Hall 8)

Exchanged with United States National Museum

Actual length one hundred and thirty-three feet; height including substructure thirty-two feet

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GEOLOGY.—Curator Oliver C. Farrington in June visited several quarries in Oxford County, Maine, where mining for feldspar, mica, etc., was being carried on. Sixty-seven specimens of minerals and rocks were collected. These were such as had been brought to light by recent activities at the quarries and for the most part had not been previously represented in the Museum collections. They included rare specimens of arsenopyrite from two localities, an unusually large and complete series of the mineral montmorillonite, various forms of muscovite, and some rare varieties of quartz. A quartz crystal weighing 800 pounds was also examined with a view to determining its desirability as a Museum acquisition. Other specimens obtained illustrated unusual mineral associations.

An expedition to Nebraska for the purpose of collecting vertebrate fossils of Upper Miocene age was carried on under the leadership of Mr. Elmer S. Riggs, Associate Curator of Paleontology, accompanied by Messrs. Bryan Patterson, J. H. Quinn and Sven Dorf of the paleontological staff. About five weeks in June and July were spent in the region. The areas visited were chiefly in northern and western Nebraska along the Niobrara and North Platte Rivers. Some side trips were also made to the eastern part of Wyoming. Camps were established at Valentine and on Sand Creek, Nebraska. While surface indications were abundant in many of the localities visited, the fossils were found in many cases to be disarticulated and waterworn. Fencing and private ownership of a large part of the area, and the unusually intense heat of the season, also interfered with obtaining as good results as had been expected. Specimens of most importance obtained were jaws of a fossil rhinoceros and remains of saber-tooth cats, oreodonts and a few other fossil mammals. Opportunity was also afforded, through knowledge of previous burials of domestic animals, to secure skeletons of the modern horse and cow, and of several other small domestic animals. A series of such skeletons had long been desired for use in the laboratory.

In the latter part of their stay, Messrs. Riggs and Patterson moved west to Bridgeport, Nebraska, where through acquaintance formed with Messrs. S. R. Sweet and Anton C. G. Kaempfer, local residents and amateur collectors, knowledge was gained of more favorable localities and collecting was carried on along the North Platte River. From this region a skull of a large oreodont, and a large, fine carapace and part of the internal skeleton and legs of a Miocene tortoise, forty-four inches in length, were obtained. Also, a skull and a ramus of the lower jaw of the four-tusked mastodon, *Trilophodon*,

were secured by gift. Altogether the expedition obtained thirty-eight specimens of fossil mammals, two of fossil turtles and six skeletons of recent mammals.

About one-third of the expense of the expedition was contributed by Messrs. Riggs and Patterson. Mr. Dorf contributed the use of his car. Grateful acknowledgment is also due to Mr. Sweet for giving freely of his time and the use of his car for several of the trips, and for assisting members of the expedition to become acquainted with local residents from whom valuable information was obtained and gifts of specimens were received.

Mr. Henry Field, Assistant Curator of Physical Anthropology, contributed the use of his car and his time on several holidays to transport Assistant Curator Sharat K. Roy and Assistant Bryan Patterson of the geological staff, and Mr. J. Eric Thompson, Assistant Curator of Central and South American Archaeology, to Blue Island, Illinois, in order to continue collecting of fossil worms of Silurian age of species which had previously been collected there, and studied and described by Mr. Roy. These fossils occur in a restricted area, so that it was desirable to secure as full a representation of them as possible in advance of a possible exhaustion of the locality. The results of the collecting were very gratifying, about 200 specimens being obtained. Besides an excellent series of the fossil worms, a number of fossil trilobites, brachiopods, gastropods and bryozoans were collected. Among the entire series, at least one species of worm and one of trilobite are new to science.

Research on the collection of South American fossil mammals has been carried forward concurrently with the preparation and determination of the specimens. Special attention has been given to the study of mammals from the Lower Eocene formations of Argentina, and a systematic account of this fauna in preparation by Associate Curator Elmer S. Riggs is nearing completion. Special studies in the morphology of some of the groups have been made, and some of the results have been presented in a Museum publication by Mr. Bryan Patterson, Assistant in Paleontology, under the title *The Auditory Region of the Toxodontia*. This paper describes certain similarities among the larger groups of South American fossil ungulates and indicates that some changes should be made in the classifications previously adopted. During the preparation and identification of the extensive collection of fossil South American ground sloths obtained by the Marshall Field Paleontological Expeditions, a large number of studies and measurements have been made

under the direction of Associate Curator Riggs with a view to preparing a systematic treatise on this great group of mammals also.

A second Museum publication by Mr. Patterson issued during the year, describes a new species of alligatoroid reptile from rocks of Oligocene age in South Dakota. The specimen upon which the paper is based was collected by a Museum expedition in 1898. Mr. Patterson also collected and collated an extensive bibliography of South American fossil mammals.

A publication in the Geological Series of the Museum, entitled *A Fossil Turtle from Peru*, written by Mr. Karl P. Schmidt, Assistant Curator of Reptiles, Department of Zoology, describes a new species of *Podocnemis* of Eocene age presented by Dr. Axel A. Olsson of Gloversville, New York. It shows an earlier dispersal than had hitherto been known of this genus, of which some species are still living.

Two Museum publications were prepared by Assistant Curator Sharat K. Roy during the year. They are *A Silurian Worm and Associated Fauna* and *Upper Canadian (Beekmantown) Drift Fossils from Labrador*. The first paper, issued during the year as No. 7 of Volume IV of the Geological Series of Field Museum, was written in collaboration with Associate Professor Carey Croneis of the University of Chicago, and is devoted to a revised description of an extremely interesting fossil worm, *Lecthaylus gregarius* Weller, and a critical survey of modern and fossil organisms allied to it. The study indicates that this worm was closely allied to modern gephyreans. The paper also describes a new species of worm and a number of graptolites found at the same locality, all of which are recorded for the first time from the state of Illinois.

The second paper, *Upper Canadian (Beekmantown) Drift Fossils from Labrador*, is now in press. It is based on collections made by Mr. Roy while a member of the Second Rawson-MacMillan Subarctic Expedition (1927-28). Specimens of a typical Upper Canadian (Beekmantown) fauna of the Atlantic American phase, not previously known to occur in the American Arctic and eastern Subarctic regions, are described. It is shown that this fauna closely resembles those of Vermont and Newfoundland and indicates a much greater northern extension of the seas of that period than had hitherto been supposed. Since knowledge of the geology of the Arctic and Subarctic regions is at best fragmentary and disconnected, this contribution is a valuable one.

Mr. Roy has also been engaged during the year in the preparation of a paper based on the collection of invertebrate fossils he made at Silliman's Fossil Mount, Frobisher Bay, Baffin Land, while a member of the Second Rawson-MacMillan Subarctic Expedition. Preparation of the specimens has brought to light many not previously observed, and a total of 301 is now available for study. Of these, the echinoderms, corals, brachiopods, pelecypods and trilobites have been identified and, with the exception of a few species of pelecypods and corals, all have been described. Twenty-five new species have been discovered in this series so far.

Dr. George R. Wieland of Yale University has continued work on the elaborate monograph on the Triassic *Araucaria* of Argentina on which he has been engaged for several years. This monograph is based upon a series of 250 specimens collected by the Marshall Field Expedition to Argentina in 1924. Material has already been prepared by Dr. Wieland for making thirty-five plates and forty text figures, and a large amount of the manuscript has been completed.

The apparatus for the preparation of micro-fossils, and the bake-lite method for hardening fossil bones, both of which were developed in the Department laboratories as described in previous Reports, attracted considerable attention during the year. At the request of the editor of the *British Museums Journal*, articles describing both methods in detail were prepared for that journal by Associate Curator Henry W. Nichols, Assistant Curator Roy and Preparator P. C. Orr.

In response to a widespread and continued demand for descriptions to be used in connection with photographs of the twenty-eight mural paintings of prehistoric life by Mr. Charles R. Knight in Ernest R. Graham Hall, a complete series of such descriptions was prepared by Curator Farrington and Associate Curator Riggs for distribution with the photographs.

Thirteen signed articles and six briefer notes were contributed by members of the Department staff to *Field Museum News* during the year.

Supplying information to correspondents and visitors continued to be an appreciable part of the work of the staff. Replies were made to correspondence from a total of 648 writers referred to the Curator's office. Information was given to 313 visitors. For the latter, many identifications of minerals and fossils were made, those of invertebrate fossils alone numbering 239.



DETAIL OF CARBONIFEROUS FOREST GROUP

Showing the trunk and foliage of the tree-like clubmosses, *Sigillarias* and *Lepidodendrons*, tree-ferns and seed-bearing plants with fern-like foliage. Reproduced in Stanley Field Plant Reproduction Laboratories, Department of Botany of the Museum

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Through cooperation with the University of Chicago, valuable assistance was received from several members of its faculty, and it was possible to render some favors in return. At the request of Professor James H. Breasted of the university, two Assyrian bronzes of great value which were seriously corroded and in danger of complete destruction were restored by Associate Curator Nichols, by means of the Fink electrolytic process. Remarkably complete restorations of each were attained. In this connection, Mr. Nichols also gave Mr. Stephen Burch of the Oriental Institute instruction in the installation and operation of the apparatus, so that further work of this kind could be carried on at the institute. A series of twenty minerals was lent to Mr. John McCormack for thesis work at the university. These minerals are to be used for study of their electrical properties. A room on the third floor of the Museum was set aside for the use of students who wish to carry on research. Tables and chairs were provided, and a series of relief maps illustrating the geography and topography of the continents was hung on the walls.

To the university grateful acknowledgments are made for the assistance and advice rendered in the construction of the Carboniferous swamp forest exhibit by Professor A. C. Noé of the Department of Botany and Professor A. S. Romer of the Department of Paleontology. Professor Noé lent a number of specimens for reproduction and gave much valuable advice as to details of structure of extinct plant species used in the restoration. Professor Romer gave information which assisted in the restoration of the amphibian, *Diplovertebron*, used in the group, and also furnished information as to details of the structure of the reptiles represented in the mural painting *African Reptiles of the Permian Period*.

ZOOLOGY.—Zoological expeditions in 1931 were mainly those continued from 1930. The most important of these were the Harold White-John Coats Central African Expedition, the C. Suydam Cutting Sikkim Expedition, and the Marshall Field Chinese Expedition.

After its success in securing material for a group of bongo and various other large mammals especially needed, the Harold White-John Coats Expedition made a trip into northeastern Kenya near the north bank of the Tana River in search of the rare and local Hunter's antelope (*Damaliscus hunteri*). This species, which is probably approaching extinction, was found in small numbers, and two fine specimens representing both sexes were taken. In the

same region interesting monkeys and other valuable material were collected. The work of the expedition was then brought to a close early in 1931.

The C. Suydam Cutting Sikkim Expedition, which had already accomplished much in 1930, was continued through the first half of 1931. Mr. Cutting himself returned before the winter season, but detailed work was carried on by Mr. Herbert Stevens, assisted by Mr. V. S. La Personne of the Bombay Natural History Society. After completing work in the Darjeeling district, the higher parts of central Sikkim were visited, and during the summer months altitudes up to 16,000 feet were reached, resulting in the acquisition of scarce and interesting animals found only in the highest parts of the Himalayas. By concentrating on a relatively limited area, the expedition was able to obtain a widely varied and representative collection, including a number of species not heretofore represented in American museums. An exceptionally fine series of monkeys was secured, and among smaller mammals the rare Tibetan water shrew (*Nectogale*) is notable. The birds include handsome examples of the magnificent Impeyan pheasant, tragopans, and various other pheasants. Approximately two thousand specimens were added to the collections as a result of this expedition. Some fourteen hundred of these are birds and four hundred are mammals. There are smaller numbers of reptiles, amphibians, and fishes.

The Marshall Field Chinese Expedition, under the leadership of Mr. Floyd T. Smith, was engaged largely in organization, preparation, and negotiation during the latter part of 1930. By January, 1931, Mr. Smith with a corps of Chinese assistants had completed all arrangements in Shanghai and proceeded up the Yangtze River by steamer to Suifu in the southeastern part of the province of Szechwan. Thence the expedition continued up the Min River in small boats propelled by oars or hauled by trackers to Kiatingfu. Here a caravan of coolie carriers was organized and the expedition went northward on foot to Yachowfu, near which the first collecting camp was established.

From Yachowfu Mr. Smith then proceeded with special native collectors to Mouping in northeastern Szechwan, a locality made famous by the pioneer collections of the French monk Armand David, which furnished the foundation for much of our knowledge of the fauna of central China. These collections, obtained over a period of years, have never been duplicated and, since they are practically inaccessible to American zoologists, it is a most important

preliminary to the study of Chinese vertebrates to have material at hand from this exact region for use as a standard of comparison. Therefore, the work of the expedition was largely concentrated in the Mouping region during the first half of the year.

Large and varied collections were made, including practically the entire known fauna. Detailed information in regard to the material, which is in transit at this writing, must await its receipt and study, but correspondence sent from the field indicates important results. Among the larger mammals obtained is an additional perfect specimen of the giant panda which augments the series received through the William V. Kelley-Roosevelts Expedition to Eastern Asia for Field Museum, making a total representation of this rare animal which without doubt is larger than is to be found elsewhere in any one institution. Several specimens of the small panda were also obtained, and interesting notes were made on its habits and distribution. Other mammals include the takin, goral, serow, and various cats and monkeys. A large collection of birds, reptiles, and amphibians also is reported.

Travel in the interior of China was beset with more than usual difficulties on account of an unfortunate increase in anti-foreign feeling, and also because of the disastrous floods and famine which prevailed during a part of the summer. Mr. Smith, who was unable to communicate with the outside world for some time and was falsely reported lost, succeeded in getting most of the collections safely transported to the coast in advance of the floods. Largely through the cooperation of the Academia Sinica in Nanking and its president, Dr. Tsai Yuan-pei, cordial relations were maintained with all the higher officials of the region traversed. Certain material was presented to the Metropolitan Museum of Natural History in Nanking, and arrangements were made whereby a complete duplicate set of specimens will revert to that institution after it has been studied and classified at Field Museum.

After bringing the collections to the coast, Mr. Smith arranged for their shipment and returned to the interior via the Yangtze River to Yachowfu where work had been continued by native collectors during his absence. Plans were then matured to have three or more different camps organized for simultaneous work in different regions, one north of the Yangtze, one just south of it, and one still farther south in the province of Kweichow. When last reported upon in November this program was well under way.

The Carey-Ryan Expedition to Indo-China, consisting of Mr. George G. Carey, Jr., of Baltimore and Mr. George F. Ryan of Lutherville, Maryland, made a successful trip during the year to the hunting fields of southern Annam and Cochin China. The expedition's especial object was to secure additional and much needed material for the completion of habitat groups of the Indian water buffalo and the gaur or seladang, two magnificent species which vie with each other for the title of largest living member of the ox tribe. The results were all that could be desired and included fine examples of both species. The bull seladang which fell to the rifles of Messrs. Carey and Ryan is one of exceptional size and fine coat. With it is a young calf which will add greatly to the interest of the group. The specimens were prepared with great care and are accompanied by full data, including photographs and plant accessories. The Museum is greatly indebted to Mr. Ryan, who financed the trip, and to Mr. Carey, whose experience on previous expeditions was used so effectively.

Through cooperation with Mr. Jean Delacour, well-known French zoologist, the Museum is participating in another expedition to French Indo-China. This expedition, under the personal direction of Mr. Delacour, was ready to start in November and will continue in the field at least until May, 1932. Little-known regions in the province of Laos, from Vientiane to Muong Ting, will be covered, and large collections of mammals and birds are expected to result. The Paris Museum and the British Museum (Natural History) will share with Field Museum in a division of these collections. The participation of Field Museum is financed by Mr. William V. Kelley.

A brief trip to California during the month of April was made by Taxidermist Ashley Hine to secure fresh specimens of birds needed for exhibits upon which work is in progress. A substantial contribution to the field expenses of Mr. Hine was made by Mr. Joseph Simons of Chicago, whose generosity is gratefully acknowledged. Mr. Hine was assisted in his work by local ornithologists in California, especially Mr. R. H. Beck of Planada. The birds obtained included several species of humming birds, various other small birds, and a number of geese and ducks not readily obtainable except in California. One of the results was the rapid completion of a handsome screen of American geese after Mr. Hine's return to the Museum.

A new zoological expedition was organized during the last weeks of December. It is financed by Mr. Leon Mandel II, of Chicago,

and its objective is the lower Orinoco River of Venezuela. Mr. Mandel sailed from Miami, Florida, December 29 on his yacht *Buccaneer* with a small party including his brother, Mr. Frederick Mandel, and Mr. Emmet R. Blake, a zoologist of the University of Pittsburgh, especially engaged to make zoological collections for Field Museum. It is planned to make a few stops in the West Indies and then to enter the delta of the Orinoco and proceed upstream as far as the stage of the water permits.

Along the lower river, at selected points, short trips inland will be made and investigations of the fauna will proceed at all possible places. Mr. Mandel's time being limited, it is probable that he will return with the yacht in February, leaving Mr. Blake to continue for several months making collections in the region between the Orinoco and the Caribbean Sea. Mr. Blake's recent experience in Venezuela as a member of an expedition for the National Geographic Society gives him special qualifications for independent work in the region, and results of considerable importance are expected.

Much research was conducted during the year by members of the staff of the Department of Zoology.

Curator Osgood from time to time continued study of the mammals obtained in Asia by the William V. Kelley-Roosevelts Expedition to Eastern Asia for Field Museum. A full report on this collection, which has proved to be of very great interest, was brought to an advanced stage of preparation and it is hoped it may be ready for publication during the coming year.

Associate Curator C. E. Hellmayr completed an exhaustive work, *Birds of Chile*, and the manuscript for this large volume was sent to press. Before leaving for Europe in July, Dr. Hellmayr had finished approximately half the manuscript of Part VII, *Catalogue of Birds of the Americas*. This volume will contain a list of all the thrushes, crows and jays, titmice, wrens, creepers, larks, nuthatches, mockingbirds, and dippers of North, Central and South America, with critical remarks on classification and distribution.

Assistant Curator Colin C. Sanborn made a study of variation in the rare South American rodent, *Dinomys*, the results of which were issued in a Museum publication, *Notes on Dinomys*. He also continued studies on the classification of American bats and prepared a list of the mammals obtained by the C. Suydam Cutting Sikkim Expedition.

Other zoological publications issued by the Museum during the year are as follows: *Bats from Polynesia, Melanesia, and Malaysia*,

by Assistant Curator Sanborn; *Birds of the Kelley-Roosevelts Expedition to French Indo-China*, by Mr. Outram Bangs and Dr. Josselyn Van Tyne; *The Painted Turtles of the Genus Chrysemys*, by Dr. Sherman C. Bishop and Mr. F. J. W. Schmidt; *Two New Rodents from Costa Rica*, by Curator Wilfred H. Osgood.

At the close of the year there was in press a paper on birds from western China by Mr. Outram Bangs. Manuscript in the hands of the editor or awaiting publication includes a report on the *Fishes of the Crane Pacific Expedition* by Dr. A. W. Herre, one on *Types of Lepidoptera in the Strecker Collection* by Messrs. William Barnes and F. H. Benjamin, and one on *Reptiles and Amphibians of the Solomon Islands* (as represented in collections of the Crane Pacific Expedition) by Assistant Curator Karl P. Schmidt.

Mr. Schmidt described a new species of fossil turtle in a publication entitled *A Fossil Turtle from Peru*, issued in the Museum's Geological Series. He also published, in the journal *Copeia* (No. 3, pp. 93-94, 1931), the description of a new toad from Korea.

Other papers by members of the staff which appeared in zoological journals are as follows: "Obituary of Count de Palmas," by Associate Curator C. E. Hellmayr, published in *The Auk* (Vol. XLVIII, p. 163), and "Obituary of Miss E. Snethlage," also by Dr. Hellmayr and published in the same volume of *The Auk* (p. 161); "A New *Oxymycterus* from Misiones," by Assistant Curator Colin C. Sanborn, published in the *Proceedings, Biological Society of Washington* (Vol. XLIV, pp. 1-2); "Protection Against Vampire Bats," also by Mr. Sanborn, published in the *Journal of Mammalogy* (Vol. XII, pp. 312-313); and two papers by Assistant C. E. Underdown—"Original Publication of *Chionophilos alpestris insularis*," and "On the Status of *Chlorospingus olivaceus* (Bonaparte)" published in *The Auk* (Vol. XLVIII, p. 441 and p. 612).

Assistant Curator Schmidt continued to accumulate information on the snakes of the local fauna with a view to the preparation of a fourth leaflet in the Museum's series on the amphibians and reptiles of the Chicago area. Certain problems regarding the garter snakes of the region were assigned to Mr. Dwight Davis, Assistant in Osteology. Mr. Walter L. Necker, of the Chicago Academy of Sciences, has also been working, under the direction of Assistant Curator Schmidt, upon certain problems dealing with the reptiles and amphibians of the local area and of Illinois as a whole.

Mr. Schmidt likewise devoted much time to classification and study of material received from recent expeditions. Reports on the

collections of the Smithsonian Biological Survey of the Canal Zone and those of the Marshall Field Central American Expedition of 1923 were well advanced. The identification of the amphibians and reptiles of the William V. Kelley-Roosevelts Expedition was completed. A paper on the collections made by the Cornelius Crane Pacific Expedition was completed and sent to press.

The collections made by the C. Suydam Cutting Expedition to Sikkim were identified, and a list of the species was supplied to Dr. Malcolm Smith of the British Museum (Natural History) for use in a forthcoming work on the amphibians and reptiles of British India.

Dr. A. W. Herre of Stanford University, ichthyologist of the Cornelius Crane Pacific Expedition, concluded a lengthy illustrated report on the fishes obtained by this expedition. A new family of fishes, six new genera, and forty-six new species are described in this report.

Assistant Curator Alfred C. Weed devoted considerable time to checking the records of Dr. Herre's report with the specimens in the Museum and to revision of the manuscript preparatory to publication. Mr. Weed was also engaged in studies for a report on the fishes from Aitutaki Island, collected by the Philip M. Chancellor Expedition which worked for several months in 1929 on that little-known island of the East Indies.

Cooperation with the zoological faculty of the University of Chicago was carried on as far as possible. Advanced classes from the university visited the Museum on a number of occasions. Assistance in the identification of specimens was given to research workers in several instances. Assistant Curator Schmidt made an address before the Biological Club of the university.

During the year various signed articles for *Field Museum News* were prepared by members of the staff, and fifteen such articles were published.

Office routine continued to increase, and the zoological staff devoted much time to necessary correspondence, interviews with visitors, inter-museum activities, and the transaction of routine business. In the Curator's office, alone, 1,189 letters were received and answered.

Records show the dispatch of 120 shipments, mainly of specimens of various kinds, and the receipt of ninety-one, not including supplies or office equipment.

SUMMARY OF EXPEDITIONS

The following list indicates the various expeditions and other field work conducted during 1931 for all Departments of the Museum:

LOCALITY	COLLECTORS	MATERIAL
KISH, MESOPOTAMIA.... (Ninth season)	L. C. Watelin René Watelin Robert Van Valzah, Jr.	Archaeological collections
COLORADO.....	Paul S. Martin	Archaeological collections
BRITISH HONDURAS....	J. Eric Thompson	Archaeological and ethno- logical collections
THE FAR EAST.....	Miss Malvina Hoffman	Miss Hoffman is engaged in making sculptures of racial types
ENGLAND.....	J. Reid Moir	Archaeological collections
EUROPE.....	J. Francis Macbride	Photographs of botanical type specimens
NEBRASKA.....	Elmer S. Riggs and assistants	Paleontological collections
ILLINOIS..... (Sag Canal)	Sharat K. Roy Bryan Patterson Henry Field J. Eric Thompson	Paleontological collections
MAINE.....	O. C. Farrington	Mineralogical collections
SZECHWAN, CHINA.....	Floyd T. Smith	Zoological collections
FRENCH INDO-CHINA....	Jean Delacour	Zoological collections
CENTRAL AFRICA.....	Captain Harold A. White Major John Coats	Zoological collections
SIKKIM, INDIA.....	C. Suydam Cutting Herbert Stevens V. S. La Personne	Zoological collections
INDO-CHINA.....	George G. Carey, Jr. George F. Ryan	Zoological collections
CALIFORNIA.....	Ashley Hine	Ornithological collections
VENEZUELA.....	Leon Mandel II Frederick Mandel Emmet R. Blake	Zoological collections

ACCESSIONS

ANTHROPOLOGY.—The number of new accessions received and recorded during 1931 was fifty-six. Of these, forty-one were gifts, five resulted from expeditions, eight from exchanges, and two from purchases. These accessions aggregate a total of about 38,000 objects.

A gift was received from President Stanley Field of a series of twenty-one bronze figures, busts and heads, reduced from life size, and two heads larger than life size, representing types of various races. These sculptures are the work of Miss Malvina Hoffman who is preparing similar figures, busts and heads in actual life size

to be used as exhibits in Chauncey Keep Memorial Hall, which is to be devoted to the subject of physical anthropology.

An Eskimo collection received in exchange from the United States National Museum at Washington, D.C., comprises material from the two oldest cultures which have so far been identified in the region of Bering Strait. This fine collection was obtained by Dr. Henry Collins from sites which he excavated personally. By using these objects for comparison with those already in Field Museum, it will be possible to identify and determine most of the Museum's Alaskan archaeological material which has not been previously identified by period.

By exchange with Mr. David Vernon of Chicago, there were acquired nineteen prehistoric stone carvings from the Mississippi Valley region. They belong to the problematical class, sometimes known as "ceremonial stones." Mr. A. B. Scott of Chicago presented a rare type of decorated stone ear ornament found near the famous Indian mounds of Arkansas.

An exchange made with Mr. Donald O. Boudeman of Kalamazoo, Michigan, resulted in an acquisition of 171 archaeological objects from his state, such as tobacco pipes, stone artifacts, axes, a maul, celts, a pestle, and polished slate problematical objects. Mrs. Frances Cowles Badger, of Barrington, Illinois, presented a large globular steatite jar from the Santa Barbara Islands. This jar, which is in perfect condition, is rare and valuable.

An important gift was received from Dr. Don F. Dickson of Lewistown, Illinois, who for years has carried on excavations in the Indian mounds around that town, and has founded a very interesting museum of mound-builders' material. Dr. Dickson's gift was a complete Indian skeleton in an excellent state of preservation, two skulls, and a collection of twenty-six specimens of pottery, flint implements and shell ornaments, all excavated by him from an Indian mound located on his property. This mortuary equipment was placed in a reproduction of a mound-builder's grave constructed in the Museum and now on exhibition in Mary D. Sturges Hall (Hall 3). It contributes a great deal toward making this group exact and complete in all particulars (see Plate III).

Four flint points, an Indian skull, and fragments of an Indian skeleton were presented by Mr. Byron Knoblock of La Grange, Illinois. The flint points were found associated with mastodon bones near Kimmswick, Missouri. Another flint is a so-called "Folsom type" (that is, a projectile of a type found at Folsom, New Mexico),

and represents, so far as is known at present, the oldest type of projectile in North America. By exchange with Mr. Knoblock, the Museum acquired also fifty-two prehistoric objects, including problematical types, tobacco pipes, beads, and stone artifacts from the Mississippi Valley region.

Seven hundred and thirty-nine objects were brought back by Assistant Curator Paul S. Martin as the result of his excavations of the Lowry ruin while in charge of the Second Field Museum Archaeological Expedition to the Southwest. This collection consists of decorated pottery, including types rarely found in Colorado, tobacco pipes, pendants, bone awls, prayer sticks, shell and stone beads, butts of roof beams (from which it is hoped chronological indications may be drawn), a stone sandal last, animal bones, potsherds for study, and ground plans. Negatives of both still and motion pictures were made.

Some of the roof logs from the rings of which approximate dates for the buildings of the Lowry ruin may be computed were sent for examination to Dr. A. E. Douglass of the University of Arizona at Tucson. Dr. Douglass has developed a method for determining the cutting dates of certain species of trees which were used as roof beams and door lintels in Pueblo houses. He reports that the date ascertained from one of the logs is A.D. 894, which means that the pine in question was cut in that year. It is impossible, of course, to state whether or not this log was immediately fashioned and incorporated as the lintel of the doorway of a room in the Lowry structure. However, it is highly probable that shortly after cutting it was trimmed and fixed in that position, and therefore it seems likely that it had remained there for more than a thousand years.

The collections made by Assistant Curator J. Eric Thompson as leader of the Third Marshall Field Archaeological Expedition to British Honduras consist of 376 archaeological and ethnological objects obtained in British Honduras and Guatemala. All of these, with the exception of some sixty objects, were obtained at the site of San José in the north of the Cayo district of British Honduras, about six miles east of the Guatemalan border. The site in question is a small religious center complete with ceremonial plaza and one plain stela, and it is surrounded by a number of scattered courts flanked by house mounds and a detached ball court.

Votive caches in pyramids yielded a number of peculiarly shaped flint objects, generally known as "eccentric flints." Some of these are in the shapes of animals and insects, but their use is unknown.

Some are large and crudely made, but in other cases the workmanship is very delicate. With them were found fine examples of thin, pressure-flaked spearheads of flint, as well as obsidian knives, and a circular mirror of iron pyrite. Burials yielded some very interesting pottery types. One vase, in particular, is an excellent example of carved pottery. It is decorated with two panels showing five seated individuals elaborately dressed.

Other graves contained vessels of peculiar shapes. Polychrome pottery was relatively scarce. Several different types of decorated human teeth were found. The finest of these consists of the four incisors and two canines of an upper jaw, all of which are inlaid with small jade disks, and in addition are filed to give a serrated appearance. So far as is known, no such complete set exists in any other museum in this country.

A number of jade objects were found with these burials. The most interesting of these is a small amulet of human shape found on the breast of a skeleton. Three fine pearls pierced for suspension were found around the neck of the same skeleton, as well as two small jade ear plugs.

From other localities a small collection of Maya jade objects was assembled, several of the pieces being of very good quality. Some fine examples of Maya pottery were obtained from other sites. Of unusual interest is a fine example of the so-called plumbate pottery, a ware containing a high proportion of lead, which gives the pottery a dull glaze after firing. This ware was manufactured in a very restricted region of El Salvador, and thence exported far and wide over the Maya and Mexican areas. Owing to its peculiar properties and rarity it was much prized by its ancient owners. The example procured for the Museum is decorated on the front with a design in relief representing a warrior. It is now on exhibition in Hall 8 (Case 13).

In Guatemala some modern textiles were collected. These are hand-woven of cotton with embroidered decorations. Good examples of these modern Maya textiles are becoming increasingly difficult to obtain since the advent of modern machinery and commerce.

A collection of fifty-four archaeological objects was secured through an exchange with the Museum of the University of Pennsylvania, Philadelphia. This material is representative of the culture of the prehistoric inhabitants of Marajo Island and other parts of the delta of the Amazon River. The greater part of the collection

consists of pottery vessels decorated with painted designs or reliefs. Some of the vessels, which were used as burial urns, are of considerable size, exceeding three feet in height. A fine example of an ancient Maya mirror from the Alta Vera Paz district of Guatemala was also obtained through exchange with the Museum of the University of Pennsylvania. The ancient Maya mirrors were made of iron pyrites arranged in mosaic fashion on a pottery or stone background.

As a result of the excavations of the Field Museum-Oxford University Joint Expedition to Mesopotamia, a vast amount of material excavated from the Kish ruins was received, particularly pottery, bronze implements, and glass. Numerous stuccos from the Sassanian palaces are included in this collection, and another shipment of these is expected to arrive early in 1932.

Dr. Arthur U. Pope of New York presented a small but significant ancient bronze fragment from Luristan, Persia. The Luristan bronzes have come to light in recent years, and have aroused much interest on account of their age and their beauty of form and design.

Mr. and Mrs. Edward W. Everett of Hinsdale, Illinois, presented a fine sixteenth century Chinese painting on silk. It represents in pleasing colors a school of carp. The painting has been hung in the South Gallery together with other Chinese paintings from the Museum's collection.

Mr. Linus Long of Chicago contributed two exquisite ceremonial jade axes of the Sung and K'ien-lung periods, respectively. A jade chape and ring and four jade girdle pendants are a gift of Dr. I. W. Drummond of New York. Another addition to the jade collection was made by the firm of R. Bensabott, Inc., of Chicago, which presented a large, square, green jade box, beautifully decorated, in which were kept official seals of the eighteenth century. The Bensabott firm also presented twenty-two oracle bones of the Shang dynasty (about 1500 B.C.). This is important material because the inscriptions carved on these bones contain the earliest form of Chinese writing now extant. Mr. Ralph M. Chait of New York presented a barrel-shaped pottery wine vessel of the Han period, larger than two examples of the same type which were in the Museum's collections previously. A neatly carved Chinese ink pallet is the gift of Dr. Gerhardt von Bonin of Chicago.

Mr. William J. Chalmers of Chicago, a Trustee of the Museum, presented a group of Algerian and Moroccan jewelry comprising silver bracelets, necklaces, earrings, pendants, and a gold charm

with chain. These objects are welcome additions to a collection of North African material which is being assembled. The jewelry presented by Mr. Chalmers is of native workmanship—a fact to be emphasized because the rapid extension of European influence and importations in North Africa is making such native work rare.

A number of archaeological collections purchased in Europe during 1930 by Assistant Curator Henry Field were received in 1931. This material is intended for exhibition in the proposed Hall of Prehistoric Man (Hall C), and some references to it were made in the Annual Report of the Director for 1930 (pp. 322-323). As the result of excavations at Ipswich, England, conducted by Mr. J. Reid Moir of that place, about 1,000 flints, including many implements of various types, have reached the Museum. In this collection are also a large number of bone fragments of cetaceous mammals which are fossilized to a marked degree. A selection of this material containing representative examples of the earliest implements known to have been made by man will be placed on exhibition in Hall C.

A valuable paleolithic collection made by the late Charles Edward Brown of Mildenhall in Suffolk, England, was obtained. It contains approximately 500 specimens, among which are many important implements of the lower paleolithic period from the Warren Hill gravel pits. An Acheulean cleaver in this collection is one of the largest of its kind in existence. Since this is a unique specimen, a mold was made from it under the direction of Mr. Reginald Smith at the British Museum, and casts were presented to the Museum of Ethnology and Archaeology at Cambridge, the Museum at Ipswich, and to Abbé Henri Breuil for the Institut de Paléontologie Humaine in Paris. In London a series of casts of paleolithic human remains was purchased from Mr. F. O. Barlow of Damon and Company, in consequence of which the Museum now has casts of the most important prehistoric human skeletal fragments found throughout the world.

As it is desirable to show objects representative of the Pleistocene fauna contemporaneous with prehistoric man, an excellent pair of mammoth tusks which had been shipped to London from northern Siberia was acquired.

Mr. Frank Munro, modeler, of Glasgow, Scotland, was commissioned to make two models of Stonehenge. One is a small round model designed to show Stonehenge as it is at present, while the other, large and rectangular, presents a reconstruction of the stone

circle and the various alignments leading away from the central group of triliths.

A series of flint and bone implements from the cave of Wady-el-Mughara in Mount Carmel, Palestine, was received from Miss Dorothy Garrod of Newnham College, Cambridge.

A series of twenty-one drawings by the late Amedée Forestier depicting life in prehistoric times was received, and these will form attractive additions to Hall C.

In France archaeological material was acquired by Assistant Curator Field to supplement collections already in the Museum. The most important collection purchased is that of Mr. Eugène Viot of Loiret. This is an excellent series of paleolithic, neolithic, bronze and iron age objects, including also many fine original Magdalenian drawings on bone, and many other examples of prehistoric human workmanship. Additions were also made to previous collections from the Dordogne region. An important acquisition, arranged through the courtesy of Abbé Breuil and Mr. L. Coulonges of Sauveterre-la-Lemance, Lot-et-Garonne, is a series of Tardenoisean microlithic implements, which are extremely rare. The archaeological collections from France now in the Museum contain a remarkably complete series of artifacts bearing on the various prehistoric periods of western Europe.

In Germany a small series of casts of neolithic pottery was obtained from the Museum für Geologie und Vorgeschichte in Dresden. A collection of mammoth bones was received from Dr. Karl Absolon of the Moravske Zemske Museum in Brünn, Czechoslovakia. These bones were excavated from the famous mammoth pit at Predmost in Moravia. Many of the long bones were split by the Aurignacian hunters in order to extract the marrow. Casts of the skeletal remains of these hunters, as well as of their artifacts, are included in this collection. From Hungary two complete burials from Szentcs were received through the courtesy of the National Museum in Budapest. These graves belong to the neolithic and bronze periods respectively. Mr. Franz Roubal, Vienna artist, completed for Field Museum a series of twenty-four pencil sketches of the more important Pleistocene fauna contemporaneous with prehistoric man in western Europe.

An unusually large flint spearhead, about ten inches long, of the neolithic period of Sweden, was acquired by purchase for the Hall of Prehistoric Man.

An interesting collection of Solutrean material was purchased through an arrangement with the Museum of Paray-le-Monial, France. This material is valuable because it consists entirely of type specimens of flint gathered directly from the famous paleolithic station Solutré in France. Notable is a perfectly chipped dagger five and one-half inches long, which is an example of the highest craftsmanship of prehistoric man. The collection includes also bone scrapers for smoothing skins and a large quantity of bones of wild horses and reindeer hunted by Solutrean men.

Mr. L. C. Watelin, residing near Sarlat, Dordogne, France, presented twenty-six flint implements of the Campignian period, representative of the late transition age between the paleolithic and neolithic periods.

Twenty-three stone implements from Denmark obtained through exchange with Mr. Byron Knoblock of La Grange, Illinois, include some interesting types that are different from any previously in the possession of the Museum.

The material relating to prehistoric man now in the Museum comprises important collections from Europe, Africa, Asia, Australia, and Tasmania. Besides the specimens reserved for exhibition in Hall C there is a study collection available for students.

In addition to the material relating to prehistoric man, some of the collections acquired by Assistant Curator Field in 1930 for exhibition in Chauncey Keep Memorial Hall (Hall B) were received in 1931. These collections include three skulls with pathological features, from France; casts of six deformed skulls from ancient Egypt; fifteen hair samples of various races; about eighty casts of heads, hands, and feet of various racial types; and 391 negatives and 618 photographs of representative racial types. Of these photographs, twenty-three which show natives of the Belgian Congo are the gift of the Ministry of Colonies, Brussels.

A large number of photographic negatives and prints, and various series of casts of racial types secured by Mr. Field, were shipped to Paris to assist Miss Malvina Hoffman, the sculptor preparing exhibits for Chauncey Keep Memorial Hall, in her study of racial characteristics. This material, together with a collection of reference books, will revert to the Museum when Miss Hoffman's work has been completed.

BOTANY.—During 1931 the Department of Botany received 255 accessions totaling 33,788 specimens. These consisted of material

for the Herbarium and the wood and economic collections. Of these specimens, 4,206 were gifts to the Museum; 11,112 were received through exchange; 3,776 were purchased; and the balance came from miscellaneous sources.

The accessions which were received during the year by the Herbarium numbered 185, comprising 33,236 specimens of plants, photographs, and negatives. Of these, 3,788 herbarium specimens were presented by correspondents of the Museum; 10,991 herbarium specimens and photographs were received in exchange; and 3,763 specimens of plants were purchased. The Herbarium acquired, principally from the Division of Photography of the Museum, 5,669 photographic prints of plants, chiefly of type specimens, most of which have been mounted and distributed into the study collections.

The most useful and therefore the most valuable addition to the Department's collections during the year consisted of 8,925 negatives of type specimens existing in the herbaria of Berlin, Munich, and Geneva, which were prepared under the direction of Assistant Curator J. Francis Macbride. These have been discussed at greater length elsewhere. They were made possible by a fund generously granted for the purpose by the Rockefeller Foundation. At the present time Mr. Macbride has in Berlin ready for shipment approximately two thousand additional negatives. These negatives are a permanent addition to the Museum collections. Prints will be supplied at cost to institutions and individuals desiring them.

The most valuable accession to the Herbarium during the year consists of the 5,669 prints above mentioned, chiefly of type or other historic specimens. All these have been distributed promptly into the Herbarium, adding immeasurably to its value as a study series. In the various groups of plants thus supplemented by photographs, the Herbarium of Field Museum now has a better representation of the American species than is possessed by any other herbarium in America.

It is gratifying to find that the largest accessions of the Herbarium during 1931 have consisted of tropical American plants, and especially of collections from South America, the region with which the staff at present is primarily concerned. The South American additions have been acquired by gift, exchange, and purchase.

From Peru fewer specimens were received than in previous years, because there were no expeditions conducted in that country in 1931. However, a few important collections have arrived. Professor Fortunato L. Herrera of Cuzco, Peru, continued his generous dona-



MURAL PAINTING, RESTORATION OF THE GREAT HORNED MAMMAL UINTATHERE
AND FOUL-TOED HORSES (*Orohippus*)

Ernest R. Graham Hall (Hall 38)

Gift of Ernest R. Graham. Painted by Charles R. Knight

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tions of Peruvian plants, and presented thirty-three specimens from the department of Cuzco in which he lives, a most desirable lot because this department has been neglected by other botanical collectors. There were received in exchange from the Gray Herbarium of Harvard University a few Peruvian plants collected by Dr. Ivan M. Johnston of that institution, particularly valuable because they were collected in the little-known southern extremity of Peru. Most of the 524 specimens received from the Gray Herbarium consisted of Chilean plants from Dr. Johnston's collection, but these are useful in the study of the Peruvian flora because of the proximity of the two countries.

The largest Peruvian collection received in 1931 consisted of a purchase of 496 specimens collected by Mr. Guillermo Klug of Iquitos, Peru, who in the winter of 1930-31 botanized along the Putumayo River. Part of his collections were made in Peru and part in adjacent Colombia. They illustrate the relationship between these two floras, and their similarity. Although thus far only a small part of Mr. Klug's most recent sending has been determined, casual inspection justifies the prediction that it will be found rich in new species. This is not surprising, since the Putumayo River had not been explored previously by botanical collectors.

The largest South American collection that came to the Museum during the year consisted of 964 specimens purchased from Mr. Pedro Jorgensen of Villarica, Paraguay. Since this country is poorly represented in North American herbaria, this accession is an especially welcome one.

From Dr. Arturo Donat of Puerto Deseado, Argentina, there were purchased 100 plants which he had collected in Patagonia, and these added numerous species to the Museum Herbarium. Fifty-five specimens purchased from Dr. Guillermo Herter of Asunción, Uruguay, likewise represented species that were mostly new to the Herbarium.

It was most satisfactory to acquire several important additions to the Museum's rapidly growing herbarium of Brazilian plants. The largest of these comprised 457 plants collected by the late Per Dusén. These were an exchange from the Naturhistoriska Riksmuseet of Stockholm, a continuation of the generous sendings of Per Dusén's plants transmitted in previous years through the courtesy of Dr. Gunnar Samuelsson. This fine series of Brazilian plants, chiefly from the state of Paraná, is a most desirable one because of the exceptionally high quality of the specimens, which,

in a large measure, have retained their natural colors, and are unusually ample.

From Mr. J. P. Schmalz of Chicago there were purchased 311 sheets of ferns, including several new species chiefly from the state of Santa Catharina, mostly determined by Eduard Rosenstock, the noted fern specialist. The Gray Herbarium sent in exchange 265 plants collected recently in Brazil by Dr. Lyman B. Smith of that institution. These were noteworthy for the large number of bromeliads collected and critically determined by Dr. Smith. Mrs. Ynes Mexia of San Francisco, California, presented forty-two specimens of plants, chiefly Rubiaceae, collected during her extended travels in Brazil and neighboring countries, which are still in progress. Names for this sending were supplied by Associate Curator Standley.

There were purchased 200 specimens of plants collected near Pernambuco by Dr. Bento Pickel. The Companhia Ford Industrial do Brasil of Belem, state of Pará, submitted 228 well-prepared specimens of trees and fiber plants. These were determined in the Department of Botany.

The Chilean herbarium was increased by the purchase of 200 specimens collected by Dr. Karl Behn, and 100 others gathered by Mr. Hugo Gunckel. To the Venezuelan collections were added eighty-one plants collected by Mr. W. Gehriger, and ninety-five purchased from Mr. José Saer of Caracas. The value of these plants was enhanced by the fact that many of them were determined by Professor Henry Pittier of Caracas, the foremost authority upon the Venezuelan flora.

From the United States National Museum, through the continued interest and courtesy of Dr. William R. Maxon and Mr. Ellsworth P. Killip, there was received during the year a large amount of exceptionally valuable herbarium material. The largest shipment consisted of 705 sheets of fully determined plants collected in Colombia by Mr. Killip and Mr. Albert C. Smith. This collection included type material of a large number of recently described species, and many other additions to the Museum's representation of the Colombian flora. Other sendings from the National Museum consisted of 116 miscellaneous South American plants, largely those of recent collectors in Venezuela, Colombia, and Peru. Most of them belonged to groups upon which Associate Curator Standley was working, especially the Rubiaceae, and for these he supplied determinations. Several new species were described from these collections. A most welcome sending from the National Museum consisted of 500 photo-

graphic prints of type specimens of plants, chiefly South and Central American. The prints are of remarkably high quality, and form an immediately useful addition to the study collections.

From the Botanical Museum and Garden, Berlin-Dahlem, Germany, through the courtesy of Dr. Ludwig Diels, the Director, and his staff, there were received in exchange two shipments, consisting of 351 complete or fragmentary specimens of plants, with numerous tracings of type specimens of the family Araceae. The fragmentary specimens represent authentic material of rare species, chiefly Peruvian, and give the Museum reference standards for many species not represented otherwise in the Herbarium.

The Conservatory and Botanic Garden of Geneva, Switzerland, forwarded in exchange, through its director, Dr. John Isaac Briquet, a valuable collection of seventy-nine mounted specimens of Malvaceae, mostly South American, determined by Dr. B. P. G. Hochreutiner, the eminent authority upon the group. From Mr. Harold N. Moldenke of the New York Botanical Garden there were purchased seventy photographic prints of type and other specimens of the genus *Aegiphila*, with which he has been working. The type photographs acquired from Mr. Moldenke, together with the Museum's own series of prints and its ample collections from the Andean region, give it an almost complete representation of this large genus of tropical plants.

There were presented by Professor Samuel J. Record of the School of Forestry of Yale University, who is Research Associate in Wood Technology on the staff of Field Museum, numerous small lots of tropical American plants and photographs, amounting in all to 113 items. Part of the plants were South American, the rest Central American. The former included type material of several species described during the year by Mr. Standley. The extensive sendings from Professor Record during past years have added to the Museum Herbarium a large amount of material of the highest value and of the most desirable character.

The current receipts of plants from Mexico and Central America have been almost as voluminous and valuable as those from South America. The largest number of them consisted of several sendings from Mr. James Zetek of Balboa, Canal Zone, totaling 928 sheets of plants collected on Barro Colorado Island in Gatun Lake. These have been described in more detail elsewhere in this Report. There were received further, as a gift, 250 specimens of plants collected on Barro Colorado Island by Dr. L. H. Bailey of Ithaca, New York,

and his daughter, Miss Ethel Zoe Bailey. Professor C. L. Wilson of Dartmouth College, Hanover, New Hampshire, presented 135 specimens which he had collected earlier in the year upon the same island. All this material was named in the Department of Botany. With the extensive collections received in former years from this island which is the present center of greatest scientific activity in tropical America, Field Museum now possesses the largest series of Barro Colorado plants that exists anywhere, and consequently one of the best collections of the flora of the whole Panama Canal Zone. Recent work on the island has revealed many additions to the list of Canal Zone plants published a few years ago by Associate Curator Standley.

Mr. C. H. Lankester of Cartago, Costa Rica, presented eighty-one specimens of Costa Rican plants, most of which represented the rarer species of the apparently inexhaustible flora of that country. Dr. Salvador Calderón of San Salvador, republic of Salvador, presented sixty-three specimens of plants from that country, to the botanical exploration of which he has contributed so freely of his time. Several of the species represented were additions to the already long list of Salvador plants published some years ago by Dr. Calderón and Mr. Standley.

Mr. Jorge García Salas of Guatemala City, Director General of Agriculture for Guatemala, presented forty-one exceptionally desirable specimens of Guatemalan plants. Most of them were gathered in the higher mountains, and they included two species apparently new, besides several rare ones not represented previously in the Museum Herbarium.

From British Honduras, in addition to a few small lots forwarded by Professor Record, there were received two important collections. One was made in the northern region of the colony by Mr. William C. Meyer of Columbia University, New York, by whom it was presented; the other was made in southern British Honduras by Mr. William C. Schipp of Belize. Mr. Schipp, who has been collecting for several years, has made what is probably the best collection of plants ever assembled in British Honduras, and he has found there an astonishingly large number of new species, or plants otherwise remarkable.

The largest of the year's collections of Mexican plants was made in the Sierra de San Carlos in the state of Tamaulipas by Professor H. H. Bartlett of the University of Michigan, by whom it was submitted to the Museum for determination. It consisted of 576 speci-



RETICULATED PYTHON, SUMATRA

Albert W. Harris Hall (Hall 18)

Philip M. Chancellor Expedition. Reproduced in cellulose-acetate
by Leon L. Walters and Edgar G. Laybourne

About one-eighth actual size

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mens, representing a great number of species, several of which were new to science, while others represented important extensions of range. Mr. Jesús González Ortega of Mazatlán, Mexico, presented 200 handsomely prepared specimens from the state of Sinaloa on the Pacific coast, which were determined by Mr. Standley. Mrs. Ynes Mexia of San Francisco transmitted thirty-nine specimens of rare plants, chiefly from central Mexico, which likewise were named in the Department of Botany.

Professor Antonio Ramírez of the Instituto de Biología of Mexico presented complete material of the huanita tree (*Beureria huanita*) from the state of Michoacán. This is probably the first authentic specimen to reach the United States. The tree was described a century ago by the Mexican botanists La Llave and Lexarza, who knew it only by a single specimen. No one else had found it since at the original locality until it was discovered there by Professor Ramírez, who likewise could find only a single individual. He very generously presented part of his material, with the kind approval of the Director of the Instituto de Biología, Dr. Isaac Ochoterena, to Field Museum, where it was studied by Associate Curator Standley, who has been able to place it definitely among the various Mexican species of *Beureria*.

From the Dudley Herbarium of Stanford University, California, through Dr. LeRoy Abrams, there were received in exchange 412 specimens of plants, the majority of which were from Lower California, which botanically is one of the most interesting regions of all Mexico. The United States National Museum forwarded in exchange 203 plants collected in Mexico by Mr. Edward Palmer, representing one of his sets previously lacking in the Museum's already large series of his plants.

Mr. Robert M. Zingg of the University of Chicago presented forty-one specimens of plants that he had collected during the past winter in the mountains of southern Chihuahua, Mexico, while accompanying an ethnological expedition of the university to that region. Mr. Zingg's large accumulation of plants was determined during the year by Associate Curator Standley, and will form the basis of a detailed report upon the ethnobotany of the area in which the work was conducted.

From Mr. H. W. von Rozynski of Jaumave, Tamaulipas, Mexico, there were received as a gift 135 specimens of plants from the vicinity of Jaumave. One of the most significant collections received on loan during the year came from the University Botanical Museum of

Copenhagen, Denmark, and consisted of remnants of the century-old exsiccatae of Liebmann from southern Mexico and of Oersted from Nicaragua and Costa Rica. The material was determined by Mr. Standley, and the Museum was permitted, through the courtesy of Dr. Carl Christensen, to retain fragmentary material, amounting to eighty-three specimens, of some of the rare species represented, a few of which were types. Several of the species thus acquired were additions to the Museum's list of Mexican and Central American species.

From the Director of the Jardin Botanique Principal of Leningrad there were received 105 duplicate specimens of Mexican and Guatemalan plants, obtained through recent expeditions sent out from that institution. The collection was determined in the Department of Botany and found to be unusually rich in rare species. Dr. Román S. Flores of Progreso, Yucatan, presented twelve photographs and specimens of Yucatan plants, two of which proved to represent important new species. Dr. Flores also has supplied several important Maya names which were either not included or not identified in the *Flora of Yucatan* published in 1930 by Field Museum.

The most important collection of West Indian plants accessioned during the year consisted of 642 Cuban specimens made by Dr. Erik L. Ekman, whose death occurred at the beginning of the year. They were received in exchange from the Naturhistoriska Riksmuseet of Stockholm, and supplement others acquired in the same manner in 1930. The Ekman plants included dozens of new species and many others of great rarity, consequently the Museum is fortunate in securing them. Dr. Ekman's collections are the richest made in Cuba by any collector, at least since the classic ones of Charles Wright seventy years ago.

From Mr. W. E. Broadway of Port-of-Spain, Trinidad, veteran collector of the floras of Trinidad and Tobago, there were purchased 115 specimens of the rarer Trinidad plants, in continuation of his numerous earlier sendings to the Museum. From Mr. E. J. Valeur of Monción, Dominican Republic, there were purchased 145 plants of that country, botanically the least known region of the Antilles.

No special effort was made during 1931 to obtain collections of plants of the United States, but several of importance were received in various ways, mostly in return for determinations, but also through gift and exchange. The only United States plants purchased were 520 specimens from Mr. C. L. Hitchcock of the Missouri Botanical Garden, St. Louis, who collected them in the western United States.

The largest lot of United States plants acquired during 1931 consisted of 1,987 specimens from the southern and southwestern states, transmitted in exchange by the Missouri Botanical Garden, St. Louis. Most of them represented the field work of Mr. E. J. Palmer, who has contributed so much to the knowledge of the flora of that region, particularly in the case of the woody plants. From the University of California, through Dr. E. B. Copeland, there were received several exchanges, totaling 854 specimens, principally Californian plants, with, however, some from other regions, especially the Pacific islands. Included were 100 specimens of willows from the western United States, all with critical determinations. These are a substantial addition to the Museum's representation of the genus *Salix*, which includes the famous Bebb willow herbarium.

From the University of California at Los Angeles, through Dr. Carl Epling, there were received in exchange 599 sheets of plant specimens, half of which were from southern California, the rest from India. Mr. Ralph Hoffmann, Director of the Santa Barbara Museum of Natural History, presented 105 specimens of critical California plants, largely from the islands off the coast. Included in his gifts were many plants of special families such as Amaranthaceae, Chenopodiaceae, and Nyctaginaceae, which were determined by Associate Curator Standley.

The United States National Museum sent in exchange thirty-nine plants collected in the western United States by Mr. W. W. Eggleston. Professor A. O. Garrett of Salt Lake City, Utah, gave forty-eight plants of Utah, which were named in the Department of Botany. From the University of Washington, Seattle, were sent 102 Alaskan plants, collected by Professor G. B. Riggs, which also were determined at Field Museum. The University of Chicago, through Professor George D. Fuller, presented two valuable lots of plants, the larger one, of 272 mounted specimens, obtained by Mr. C. F. Cox in connection with his studies of the alpine vegetation of Colorado. The other, of eighty-one numbers of willows, with flowering and fruiting specimens taken from the same individual, was made some years ago in Alberta by Mr. R. H. Dixon, a resident botanist of that province.

Mr. George E. Osterhout of Windsor, Colorado, one of the most active local botanists of the whole Rocky Mountain region, generously presented to Field Museum type material of two new species of Colorado plants that he described recently. From Mr. George L. Fisher of Houston, Texas, there came as a gift 221 plants gathered

in western Texas and southern New Mexico. They included many rare species, and two color forms that seem to have escaped the attention of other collectors. Among the specimens from the New Mexican mountains were a number of rare species collected at their type localities, and therefore of more than ordinary value for purposes of study and comparison. The Witte Memorial Museum of San Antonio, Texas, through Mrs. Ellen Schulz Quillin, presented fifty-four specimens of Texas plants that were determined in the Department of Botany.

From the Arnold Arboretum of Harvard University, Jamaica Plain, Massachusetts, there were transmitted in exchange by Dr. Alfred Rehder 387 specimens of plants from different regions. Part were woody plants from the United States, some were collected in Cuba, and others were from China. Professor Stanley A. Cain of Butler University, Indianapolis, Indiana, presented thirty-seven plants of the heath family which he had obtained in Tennessee and North Carolina. Most remarkable among them was a specimen of the box huckleberry, *Gaylussacia brachycera*, from Tennessee, a state in which this exceedingly rare plant was not previously known to occur. The box huckleberry is a creeping shrub, a single individual of which sometimes covers an acre or more of ground, and it is estimated that it lives hundreds, if not thousands, of years.

From the Catholic University of America, Washington, D.C., there were acquired through exchange 275 sheets of plants. While the majority of these were from Florida, a considerable number were collected in Brazil.

An important exchange from Dr. Morten P. Porsild of the Danish Arctic Station, Disko, Greenland, consisted of 365 Greenland plants. These well-prepared and authoritatively determined specimens are a useful aid to studies upon the flora of northern North America.

Dr. C. E. Hellmayr of the Department of Zoology of Field Museum presented twenty-six specimens of rare orchids of North America and Europe. Among them was type material of a new species of coral-root or *Corallorrhiza*, collected by Dr. and Mrs. Hellmayr in Wyoming, and described in a recent number of *Rhodora*.

Of the plants having special interest in connection with the floras of the Chicago region and the states of Illinois and Indiana several lots of particular interest reached the Museum during 1931. Rev. J. A. Nieuwland of the University of Notre Dame, who knows so well the plants of the Great Lakes region, presented material of an interesting orchid that he had collected. Dr. Th. Just of the same

university presented another rare orchid, an *Isotria*, from Indiana. Mr. Charles C. Deam of Bluffton, Indiana, who is preparing a detailed account of the Indiana flora, presented six specimens of Indiana plants, including a hybrid oak, *Quercus Deamii*. From Mrs. Ralph Clarkson of Chicago there were received for determination several lots of local and other plants. In Illinois Mrs. Clarkson obtained a quantity of curious "double" wild plums. These double fruits prevailed on several wild bushes. Each consisted of two small red plums grown together and having in common a single pit. While scattered "double" fruits of this sort are not particularly rare, it is most unusual to find a large number of them upon a single plant.

The receipts of plants other than American in 1931 were rather meager, and no special effort was made to obtain them, since the large collections of tropical American plants arriving at the Museum occupy the staff of the Herbarium too fully to justify a special effort toward increasing the foreign collections. From the National Herbarium of Victoria, Australia, there were received in exchange fifty specimens of Australian plants; from the Naturhistoriska Riksmuseet of Stockholm, 327 European plants. The New York Botanical Garden submitted in exchange 249 valuable photographic prints of type specimens, largely of important species of the citrus group of the family Rutaceae. An important exchange from the same institution consisted of the many volumes of *Gartenflora* needed to complete the Museum set of this useful publication, the chief interest of which is its many illustrations of plants.

Dr. Rudolf Probst of Langendorf, Switzerland, presented forty-eight specimens of the adventive plants of Switzerland, most of them of North American origin. From Mr. T. O. Weigel of Leipzig, Germany, there were purchased 311 specimens of plants of the family Rubiaceae, the majority of them from Europe and northern Africa.

Through Dr. A. S. Hitchcock of the Office of Systematic Agrostology of the United States Department of Agriculture there were received 289 specimens of grasses of tropical America. These make a practical addition to the grass herbarium of Field Museum because they are critically determined, and therefore dependable for purposes of comparison when making determinations. Dr. Earl E. Sherff of Chicago, who has visited the Museum many times during the year for study in the Herbarium, presented fifteen specimens of Compositae referable to groups in which he is especially interested.

An important accession from the Department of Botany of the University of Michigan, received in exchange, consisted of 522 plants from Sumatra, a country otherwise hardly represented in the Herbarium. They were collected a few years ago by Professor H. H. Bartlett, head of the Department of Botany of the university.

During the year the Museum received 282 specimens of woods, partly for study and partly for exhibition purposes. These were obtained from correspondents of the Museum, lumber concerns, forestry organizations and individuals. The Museum gratefully acknowledges the generous assistance which has enabled it to obtain so many representative specimens of both domestic and foreign woods for display.

A fine board of Monterey cypress was given by Professor Emanuel Fritz of the University of California and is now on exhibition in the Hall of North American Woods. Professor Fritz also contributed six large boards of sugar pine, four pine cones of the same species and a board of blue gum (*Eucalyptus globulus*).

From the W. O. King Lumber Company of Chicago there were received, through the cooperation of Mr. Charles S. B. Smith, two excellent boards, eight feet in length, of sugar maple, one of which shows beautiful bird's eye figure and the other flat grain. Mr. O. H. Campbell of the Great Southern Lumber Company, Bogalusa, Louisiana, gave two boards of longleaf pine. These form a desirable addition, completing an exhibit of this species.

A complete series of western larch, consisting of slab sections of trunk, a wheel section and boards, was presented by the J. Neils Lumber Company of Libby, Montana. A trunk section of tamarack and a small board of sugar maple were presented by the Von Platen-Fox Company of Iron Mountain, Michigan, through the courtesy of Mr. Allott M. Fox. The Edward Hines Lumber Company, Chicago, through its unit at Burns, Oregon, sent two excellent boards of western larch.

Fine exhibition material, consisting of a trunk section and two boards of southern white cedar, was presented by the Richmond Cedar Company of Richmond, Virginia. The Seattle Cedar Lumber Manufacturing Company furnished, at the request of the West Coast Lumbermen's Association, excellent material of western red cedar. The series consists of trunk slabs, wheel section, and two boards, forming an important addition to the collection of the principal commercial woods of the west coast.

The Eastman-Gardiner Hardwood Company of Laurel, Mississippi, contributed a complete exhibit series of sycamore—trunk slabs, wheel section and two boards. To augment this the Keith Lumber Company, Chicago, gave a flat-grained board of the same species. Through the courtesy of Mr. H. M. Dickman, the Berst-Forster-Dixfield Company of Cloquet, Minnesota, presented a trunk, wheel section and boards of paper birch.

From the H. R. Crews Lumber Company of Tulsa, Oklahoma, the Museum received, through Mr. Ira D. Crews, a log section, wheel section and two boards of Osage orange from the company's mill at Paris, Texas. This material had not previously been represented in the Museum's collection and forms a welcome addition. Two specimens of unusual interest are "knees" of southern cypress, obtained through the assistance of the Chicago office of the Florida-Louisiana Red Cypress Company.

New material of foreign woods for exhibition purposes has been received through the cooperation of various friends of the Museum and from importers and manufacturers of such woods. During the past year the valuable assistance obtained has resulted in the acquisition of a great number of commercially important woods of Europe, Africa and India, hitherto not represented in the collection.

From the Yale University School of Forestry, through the courtesy of Professor Samuel J. Record, Research Associate in Wood Technology of the Museum, there were received two boards of jequitibá (*Cariniana legalis*), a tree of immense size native to southern Brazil. In addition the Museum received in exchange from the same institution 119 hand specimens of woods from the republic of Liberia, West Africa. These form a part of the collection assembled by Mr. G. Proctor Cooper during 1928 and 1929 for the Yale University School of Forestry in cooperation with the Firestone Plantations Company. The International Paper Company of New York, at the suggestion of Professor Record, contributed ten samples of Brazilian pulpwoods. The Conservator of Forests of British Honduras presented a collection of sixty-two hand specimens of the principal woods of the colony. A large board of ipil, an important wood of the Philippine Islands, was presented by Mr. Ralph A. Bond of Chicago.

One of the most important gifts of foreign woods was that received from Ichabod T. Williams and Sons of New York, through the generosity of Mr. T. R. Williams. The series consists of veneered panels of mahogany, eight feet long, representing the Cuban, Mexi-

can, and African species. In order to show the variation of figure and color obtained, two or three panels of each species have been included. In addition Mr. Williams donated a board of figured teak from Burma. From J. H. Smith Veneers, Inc., of Chicago, there were received fifteen face veneers of important European, Australian, and Indian woods. Attractive panels of these were kindly prepared by the Schick-Johnson Company of Chicago. In addition, through the courtesy of Mr. J. H. Smith, president of the veneer company, there were also received sixteen small veneer samples of foreign woods of importance in the American trade.

The R. S. Bacon Company of Chicago contributed eleven face veneers of African and East Indian woods. These were made up into panels by the American Plywood Corporation of New London, Wisconsin. The Williamson Veneer Company of Baltimore, Maryland, presented two veneered panels of Santa Maria (*Calophyllum calaba*), a species of tall timber tree occurring in Central America and northern South America. From Mr. Howard Spence of Southport, England, the Museum received, in exchange, hand specimens of English and Venezuelan walnut. From Dr. Román S. Flores of Progreso, Yucatan, there was received a hand specimen of a new species of fruit tree known in Yucatan by the Maya name Coloc. Associate Curator Standley identified the species as *Talisia Floresii* and it was described by him in the June issue of *Tropical Woods*.

The accessions of economic botanical material, other than woods, were obtained principally for exhibition purposes in Hall 28. They may be separated into six classes: fibers and cellulose products, tans, dyes, resins, rubber, and tobacco. By far the greatest number of these accessions fall under the heading of fibers and cellulose products. They include baskets and basketry materials, brushes and brooms, hats, textiles, twine, paper-making materials, and celluloid.

The baskets and basketry materials were obtained from five sources. Six mats woven from thin strips of conifer wood were presented by the Raedlein Basket Company of Chicago. The Artistic Reed and Willow Manufacturing Company, Chicago, was the source of two trays of willow wickerwork and a bundle of osiers. Rattan chair seating and a bundle of rattan splints came from May's Rattan Works, Chicago. Two baskets made of carnauba palm, obtained by the Marshall Field Botanical Expedition to the Amazon in 1929, were accessioned. Mrs. Berthold Laufer of Chicago presented a coil basket made of the silver-top palm from New Providence, Bahama Islands.



PAINTED POTTERY FROM BURIAL MOUNDS IN ARKANSAS

Mary D. Sturges Hall (Hall 3)

Illustrating installation of specimens on individual shelves against light-colored screen

About one-tenth actual size

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Additions to Field Museum's collection of brushes and brooms have been secured from two Chicago firms this year. The Haisler Brothers Company supplied fibers and brushes of bassine, Mexican grass, Bahia fiber, piassaba fiber, and palmyra fiber, all of which are in everyday use in this locality. The common house broom and whisk broom, both of which are made from the tops of broom corn (sorghum), were furnished by the Imperial Broom Company.

The exhibit of material used for hat making has been augmented by gifts of material from three firms. Frank Schoble and Company of New York furnished many specimens of hats in various stages of manufacture. These include materials from Japan, China, Italy, Philippine Islands, and Switzerland. Among the materials represented are hats of sennit braid, leghorn, bangkok, yeddo, baku, mackinaw, and balibuntal. The John B. Stetson Company of Philadelphia supplied an excellent exhibit of the panama hat in its many stages of manufacture. Through the kindness of the Italian Chamber of Commerce of Chicago there were obtained from Giulio Corti and Fillo of Signa, Italy, a number of hats made in Italy. These include the materials known as charmeuse, pedal raveggiolo, ramio, racello, ramie, and cincina.

The various fibers and textile materials accessioned during 1931 consist of Asiatic cotton bolls received from the Bureau of Plant Industry, Washington, D.C.; stalks of bamboo from Garfield Park Conservatory, Chicago; chair seats woven of cat-tail flags from the Heywood-Wakefield Company, Chicago; sedge plants, twine, and matting from the Deltax Rug Company, Oshkosh, Wisconsin; sisal and manila hemp twine and slivers from the International Harvester Company, Chicago; coconut fiber rug, manila fiber rug, and rush and sedge matting from Marshall Field and Company, Chicago; and raffia baskets and cloth from Madagascar, supplied by the Department of Anthropology from material obtained by the Marshall Field Anthropological Expedition to Madagascar a few years ago.

To supplement the exhibit of paper-making materials some gifts of cornstalk paper and cotton paper were solicited. The Kalamazoo Vegetable Parchment Company, of Kalamazoo, Michigan, supplied cornstalk paper, and the American Writing Paper Company, of Holyoke, Massachusetts, furnished samples of cotton paper in its several steps of manufacture.

In modernizing the celluloid exhibit it was found advisable to add some moving picture film. This was obtained from the Universal Film Exchange, Chicago.

The exhibit of vegetable tanning materials was made more complete by the addition of some bark of the California tanbark oak presented at the suggestion of Professor Emanuel Fritz by Mr. S. H. Frank, of Redwood City, California. To show the effect of different vegetable tanning materials used in leather manufacture samples of chrome, quebracho, and sumac tanned leather were given by the Monarch Leather Company, Chicago.

The vegetable dye exhibit was supplemented with henna leaves obtained by purchase.

An improvement in the exhibit of products obtained from longleaf pine by distillation was effected by the addition of a sample of commercial abietic acid received from the Hercules Powder Company of Wilmington, Delaware. Abietic acid is the principal constituent of rosin.

A trunk of a Hevea rubber tree suitable for exhibition was presented to the Museum by Mr. Paul Van Cleef, Chicago. This trunk, a large specimen more than a foot in diameter, is from a tree which was at least fourteen years old. The tapping marks and the plantation number on the trunk add to the educational value of the specimen. This gift fills a long-felt need in the Department of Botany.

The accessions of tobacco received during the year have been of material benefit in the revision of the exhibits of this important plant and its products. John H. Meyer and Son, Chicago, presented many excellent specimens of cigar leaf tobacco. A. Zaphirio and Company, Chicago, furnished splendid samples of Turkish cigarette tobacco, and the firm of Kuttner and Franke, Chicago, supplied a series of tobacco insecticides and other products.

A number of additions to exhibition material designed for use in the Hall of Plant Life (Hall 29) were accessioned as a result of the activities of the Stanley Field Plant Reproduction Laboratories of the Department. Among these are the following: a small-scale model of a clubmoss tree of the genus *Lepidodendron* to show the dichotomous branching of the aerial as well as the terrestrial parts of these Paleozoic forest trees; a restoration of a fruiting branch of *Lepidodendron obovatum* with numerous small cones; another of *Lepidostrobus ovatifolius*; a restoration of a plant of *Sphenophyllum emarginatum*; a restoration of a fruiting branch of *Cordaites borassifolius*; a reproduction of a flowering branch of the tulip tree (*Liriodendron tulipifera*); a reproduction of a flowering and fruiting branch of arnatto (*Bixa Orellana*); a reproduction of a large yam (*Dioscorea batatas*); reproductions of two enormous fruits of the milkweed

family, both fleshy pods more than a foot in length produced by tropical vines of the genera *Marsdenia* and *Vincetoxicum*, native to British Honduras. The originals of the milkweed fruits were received at the Museum in 1930 through the kindness of Professor Samuel J. Record, of Yale University School of Forestry (who is also Research Associate in Wood Technology on the Museum staff). The original specimen of *Bixa Orellana* was obtained in Pará by the Marshall Field Botanical Expedition to the Amazon in 1929.

GEOLOGY.—Accessions were received during the year from eighty-seven individuals and institutions. Of these, fifty-eight were by gift, twelve by exchange, five by collection, and twelve by purchase. These accessions included a total of 1,949 specimens.

One of the most important gifts the Museum has ever received was completed during the year by the delivery of the final canvases in the series of twenty-eight murals representing the life and scenery of past geological periods, presented by Mr. Ernest R. Graham. These paintings by the noted artist, Mr. Charles R. Knight, represent the culmination of the skill and experience of a lifetime devoted largely to depicting the animals of the past. The paintings restore vividly the often strange and curious shapes of prehistoric life, both plant and animal, and show the gradual development and enlargement of life from its beginning up to historic times. This work has been done not only in accord with the highest principles of art, but also incorporates the latest and most accurate scientific knowledge as obtained from leading authorities. The appreciation which these paintings have received, is shown not only by the interest in them manifested by visitors, but also by a world-wide demand for photographs of them. Of the twenty-eight paintings, fourteen are twenty-five by nine feet in size and fourteen are eleven by nine. One of them is represented in Plate XIV of this Report.

Two magnificent and extremely valuable gem specimens were presented by the late Mr. Richard T. Crane, Jr., a few months before his death. One is a cut ruby topaz weighing 97.55 carats. It is cut in the form known as "table cut" and is one and one-quarter by seven-eighths inches in size. This is a flawless stone of a color known as rose or Brazilian ruby. It is probably the finest example of this type that has yet been produced. The second stone is a plaque of black Australian opal weighing 148 carats and having a polished surface of two by one and one-half inches. On the black background of this stone brilliant colors are thickly displayed, blend-

ing into changing tints as seen at different angles. These colors are of the rarest and most desirable type. Both of these specimens have been added to the exhibits in Harlow N. Higinbotham Hall (Hall 31).

Mr. William J. Chalmers presented two silver bricks of historic as well as intrinsic value. One of these bricks, weighing thirty-seven ounces, was made in 1878 by the first water-jacket furnace operated at Leadville, Colorado. The second specimen was a bar of silver, weighing eight and one-half ounces, made from the ore of some of the first silver mines that were operated in Montana. Mr. Chalmers also made additional gifts to the crystal collection, including a geode six inches in diameter containing extraordinarily large crystals of cuprite. In addition he presented eight specimens of rare minerals occurring in the pegmatite of Newry, Maine. These included several specimens of unusual perfection of the rare manganese phosphate, eosphorite, and of the beryllium phosphates, herderite and beryllonite. The specimens of the last named represent the second known discovery of the mineral.

To complete the exhibit representing the evolution of the horse, Mr. Frederick Blaschke, the sculptor, of Cold Spring-on-Hudson, New York, prepared and presented to the Museum a beautiful model of the famous race horse, "Man o' War," as a representation of the highest type of a modern horse. This model, one-fifth actual size, was made from life and is a fine example of this sculptor's skill.

A series of twenty-six specimens of rare metals was presented by Mr. Herbert C. Walther of Chicago. Only one or two of those presented have been previously represented in the Museum collections. The gift included examples of metallic tungsten, palladium, thallium, tellurium and titanium.

Mr. Frank von Drasek of Cicero, Illinois, continued his contributions of representative specimens of the minerals of Arkansas by presenting 105 new examples. Those presented include some large and brilliant groups of crystallized quartz, a number of specimens of the peculiar acicular apatite of Magnet Cove, and specimens of typical elaeolite, schorlomite, brookite, etc., besides eight specimens of the satellites of diamond occurring at Murfreesboro, Arkansas.

Ten photographs, eleven by fourteen inches in size, representing various formations in the interior of limestone caves, were presented by Mr. Russell T. Neville of Kewanee, Illinois. These photographs were made by Mr. Neville in the course of many years of cave explorations and illustrate some unusual and remarkable formations. They are from such well-known caves as Carlsbad, Mammoth and



OKRA (*Hibiscus esculentus*)

(Hall 29)

Reproduced from nature in Stanley Field Plant Reproduction
Laboratories, Department of Botany of the Museum

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Wyandotte, as well as from others less known, such as Onondaga and Dossey's caves.

A remarkable series of fulgurites, or what are commonly known as "lightning tubes," was presented by Mr. E. A. Mueller of Chicago. His gift comprises 301 specimens from two localities not previously represented. One series was found in Ableman, Wisconsin; the other near Saugatuck, Michigan. These fulgurites represent a large variety of the forms produced by lightning, such as forked, sintered, winged, smooth and rough tubes. Since Mr. Mueller is an electrical engineer he collected the tubes with unusual skill, preserving their unique features.

Messrs. Roy Muhr of Redington, Nebraska, and Anton C. G. Kaempfer of Bridgeport, Nebraska, presented a skull and jaw of the so-called four-tusked mastodon, *Trilophodon*. These examples of this rare animal furnish the best representation of the skull and jaws which has thus far been obtained by the Museum.

A welcome gift for addition to the meteorite collection was a portion of a newly discovered meteorite from Randolph County, North Carolina, presented by Mr. Harry T. Davis of Raleigh, North Carolina. This specimen well illustrates the essential characters of the meteorite.

A specimen illustrating a new occurrence of the rare mineral volborthite and representing the second known occurrence of this mineral in the United States, was a gift, highly appreciated, from Mr. F. H. Pough of St. Louis.

A group of amazonite crystals of unusually good color and well-defined form from Amelia Courthouse, Virginia, presented by the American Gem and Pearl Company of New York, gives the best representation that has been thus far obtained for the Museum of the amazonite of that locality.

A specimen of the new borax mineral, kernite, which now constitutes the principal source of crude borax, was presented by the Western Borax Company of Los Angeles. This mineral, being a sodium borate, requires much less treatment to prepare for the market than the calcium borate which hitherto has been the chief source of commercial borax.

Through the kind interest of Mr. R. E. Demmon, president of the Stauffer Chemical Company of Freeport, Texas, a number of specimens which illustrate the deposits now supplying the bulk of the world's sulphur were received. These specimens include three from

the Stauffer Chemical Company and four specimens and four charts from the Freeport Sulphur Company. A section of a drill core showing sulphur intercalated with limestone, and charts showing the structure of the dome in which the sulphur occurs, are of especial interest in this series. From the details given in the charts, it is hoped soon to prepare a small model of a sulphur-bearing dome.

Mr. J. K. Hawkes of Kansas City, Missouri, donated a number of large sheets of transparent gypsum from a recently discovered outcrop at Barton, Oklahoma.

A specimen of bog-iron ore from Indiana was a welcome accession received from Mr. John Palm of Lakeside, Michigan. Typical specimens of this ore had been lacking hitherto in the Museum collections.

Some specimens of a newly discovered black, oolitic marble from Death Valley, California, with three other specimens of rocks and minerals from the region, were presented by Mr. William B. Pitts of Sunnyvale, California. The oolitic specimens are of large size and were polished by the donor in order to show the oolitic structure more clearly.

Mr. George M. Coram of Utica, New York, presented a large specimen of the so-called "box crystal" from Port Leyden, New York. This unusual formation represents a succession of changes of minerals which has been the subject of considerable study, and as the occurrence was a limited one and is now exhausted it is gratifying to have this representative specimen.

Mr. R. C. Swank of Chicago was the donor of a concretion from Kansas of unusual size and peculiar shape. The shape is disk-like and the diameter is fifteen inches. This concretion had been treasured for many years by a friend of Mr. Swank, Mr. John Klopper, and on the death of the latter, Mr. Swank kindly procured the concretion as a gift for the Museum.

Other unusual specimens presented were two chalcedony geodes containing water. They were given by Mr. Ralph M. Chait of New York.

Seven specimens of skulls and jaws of fossil vertebrates, representing some of the smaller Miocene ungulates, were presented by Mr. S. R. Sweet. These specimens were collected by Mr. Sweet in the neighborhood of his home in Bridgeport, Nebraska.

Some remarkably well-preserved specimens of fossil coal plants from Nanticoke, Pennsylvania, were presented by John Bigane and

Sons of Chicago. The specimens of *Sphenophyllum*, showing several slender, jointed stems to which are attached whorls of the wedge-shaped leaves, are especially fine for both study and exhibition purposes.

A jaw of one of the extinct group of short-footed ungulates known as amblypods was presented by Mr. E. B. Faber of Grand Junction, Colorado. It was found near Grand Junction. Preliminary examination indicates that the animal which the specimen represents had specific characters distinguishing it from any previously known.

Another rare fossil jaw presented was one of the extinct giant beaver known as *Castoroides*. This was found at Mount Ayr, Indiana, the locality from which a large mastodon skull was procured for the Museum some years ago. The *Castoroides* jaw is a gift from Mr. Joseph Comer of Rose Lawn, Indiana.

Messrs. Bryan Patterson and Frank Letl of the Museum staff, and Mr. Paul Letl and Miss Nan Mason of Chicago, presented a number of specimens of fossil plants, two insects and a septarium which they obtained on two trips to Braidwood, Illinois. A total of twenty-six specimens was received, among which were well-preserved impressions of leaves, of several species of seed-ferns and of two specimens of insects. One of the last was an insect allied to modern cockroaches which was preserved nearly complete.

A skilfully carved object of green fluorite from Cumberland, England, was presented by Mr. Martin L. Ehrmann of New York. It was cut from a rough mass of fluorite in the form of capped twin vases, eight by nine inches in size, with an elaborate pattern in low relief carved upon them. This is the only specimen thus far received by the Museum which illustrates the possibilities of this mineral as a medium for engraving.

By exchange an unusual amount of valuable material was received. First in importance may be mentioned four complete skeletons of vertebrate fossils from the so-called "tar beds" at Los Angeles, California. They were received from the Los Angeles Museum of History, Science and Art. The skeletons represent extinct species of horse, bison, ground sloth and carnivore. The completeness and authenticity of these specimens make them of great value. Practically all of them will be suitable for articulation and mounting as opportunity permits.

Another valuable specimen of a recently extinct animal obtained by exchange was that of a very complete and well-preserved skull and jaws of the so-called woolly rhinoceros. The large size of the

skull well illustrates the proportions of this animal, which was abundant in Europe during the glacial period, and contemporaneous with early man. It had not previously been represented in the Museum collections. The specimen was obtained from the Royal Natural History Museum of Brussels, Belgium.

From the British Museum (Natural History), London, specimens of three different species of trilobites from the Cambrian beds of Wales, form a valuable addition to the representation of fossils of Cambrian age.

Some remains of fossil vertebrates from Cumberland Cave, Maryland, received from Mr. C. W. G. Eifrig of River Forest, Illinois, by exchange, illustrate some of the extinct species found in that cave. Of especial importance among these is a species of dog. A study of the teeth of this species by Assistant Bryan Patterson has afforded new data which will soon be published.

Four representative specimens of meteorites were obtained by exchange. Of these, one was of the Olmedilla (Spain) meteorite. This specimen weighs 397 grams and shows both interior and crust. It came from Mr. C. Wendler of Geneva, Switzerland. A large, etched section of the Tacubaya (Mexico) meteorite, weighing 276 grams, was received from Professor H. H. Nininger of Denver. Through Professor Nininger there was also obtained, partly by exchange and partly by purchase, a section weighing forty-eight grams and a cast of the Brule (Nebraska) iron meteorite. A section of the Adams County (Colorado) meteorite weighing 250 grams and showing crust and interior, was also received partly by exchange. All the meteorites obtained represent falls not hitherto possessed in the Museum's collection.

From Mr. H. G. Clinton of Manhattan, Nevada, there were received by exchange twenty-one specimens of minerals, few of which had been previously represented in the Museum's collection. Of especial importance was a series of the rare aluminum phosphates vashegyite and barrandite, and of the semi-precious stone called utahlite. The utahlite series included a number of cut and polished specimens. The material will probably also yield a number of the recently described phosphates known as englishite, dernite, etc. A specimen of the little-known mineral belmontite, a rare lead silicate, was also included in this accession. Only a few specimens of this mineral are in existence.

Thirteen specimens of rare minerals were obtained from Mr. Joseph Linneman of Buffalo, New York, by exchange. They included

specimens of delafossite, tungstenite, franckeite, plumbojarosite, and the rare mercuric oxide, montroydite.

Nine gems were cut from rough material of beryl, zircon and tourmaline, most of which was collected in Brazil by the Marshall Field Expedition of 1922. The cutting was done by an expert, Mr. Stuart D. Noble, of Minneapolis, whose services were obtained in exchange for a portion of the material. The golden beryl and tourmaline from this cutting are of unusual beauty.

From Mr. Joseph Bianchi of Paterson, New Jersey, there were received by exchange a large, representative specimen of the newly described silicate called norbergite, an excellent specimen of the manganesian pyroxene known as schefferite, and two other minerals.

Accessions obtained on collecting trips included sixty-seven specimens of minerals and rocks procured by Curator Oliver C. Farrington from quarries in Oxford County, Maine. In this series were incorporated a number of minerals not previously represented from these localities, as well as larger and more representative specimens of minerals than had been previously collected. From the Marshall Field Expedition to Nebraska for collecting fossil vertebrates there were received thirty-eight specimens of fossil mammals, two of fossil tortoises and six skeletons of recent mammals. These were all much-desired additions. Among the vertebrate fossils represented in the material collected are the aquatic rhinoceros, *Teleoceras*, the early horse, *Meshippus*, the camel-like *Procamelus* and the carnivore, *Hoplophoneus*. Among skeletons of modern domestic animals collected were those of a cow, horse, sheep and dog. These will be of much service for comparison with fossil allied species.

By means of two collecting trips made by members of the Department staff to Sag Canal, Illinois, the representation of fossil worms of the locality was increased by a large number of specimens, one group being the finest yet secured. There were also collected fossil trilobites, brachiopods, gastropods and bryozoans, making a total of 300 specimens.

Specimens obtained by purchase were chiefly additions to the meteorite and vertebrate fossil collections. An iron meteorite from Breece, New Mexico, weighing 115 pounds, was obtained by purchase. It represents the entire mass of this fall, and is a well-preserved, typical iron meteorite which gives figures of unusual beauty when etched. An end piece of the Newport (Arkansas) ironstone meteorite was also purchased, giving an excellent representation of this rare type of meteorite. The purchase of two skulls and jaws and other

skeletal parts of *Protitanotherium* places the Museum in possession of the largest representation thus far known of this important ancestor of the titanotheres. A head of the great fossil fish, *Portheus*, mounted for exhibition, was another purchase. A horn, three feet six inches long, attached to a part of the skull of the fossil bison, *Bison regius*, from Oklahoma, was purchased. It not only represents a species new to the collection but is probably a record length for a bison horn. Two casts of dinosaur tracks from Grand Junction, Colorado, were purchased. They illustrate the size and character of footprints of these great reptiles. One of the slabs shows a footprint about two feet in diameter.

To the collection of invertebrate fossils, six specimens of crustaceans, crinoids and starfish from the Lower Devonian of Bundenbach, Germany, were added by purchase. These specimens are notable for the perfection and delicacy with which the details of their structure have been preserved.

A collection containing twenty species of fossil leaves and flowers of Miocene age from Oregon gives a very complete representation of a newly discovered deposit there. The fossils are dark in color on a pure white matrix, and thus furnish specimens not only of scientific importance but of attractive appearance. Identifications of all the species were made by Dr. R. W. Chaney of Washington, D.C.

An exhibit illustrating the variety of gases of the atmosphere was also obtained by purchase. These specimens represent the eight principal gases of the air, not including carbon dioxide. The gases are enclosed in tubes furnished with electrodes which permit the passage of an electric current to show the spectrum of each.

ZOOLOGY.—Zoological specimens were accessioned to a total of 11,332 during 1931, which is somewhat less than in recent years, the average number for the past six years having been 14,418. The year's accessions are distributed among the different divisions as follows: mammals, 1,358; birds, 2,432; reptiles and amphibians, 1,369; fishes, 4,220; insects, 1,953. The number obtained by Museum expeditions is 6,624; by gift, 2,846; by purchase, 1,154; and by exchange, 708.

Gifts of mammals, while not large numerically, include some important and valuable additions to the collections. Mr. Marshall Field of New York presented four lions shot by himself and Mrs. Field in Africa. These are of fine quality, and include a male, a

female, and two kittens. They provide material especially needed for a proposed group in Carl E. Akeley Memorial Hall.

Mr. James E. Baum, Jr., of Lake Forest, Illinois, presented six Persian goats and two Persian wild asses which he shot during the course of a personal expedition. Viscount Furness of Invernesshire, Scotland, gave the Museum two very complete specimens, including skins, skulls, and skeletons, of the Scotch red deer. From Tanganyika Territory, Africa, the late Mr. R. H. Everard of Arusha, Africa, shortly before his death, sent an exceptionally large and fine specimen of scaly anteater. Mrs. Grace Thompson Seton of Greenwich, Connecticut, gave fifty-four bats which she personally collected in the Philippine Islands. Twenty-eight Mexican mammals were given by Mr. Robert M. Zingg of Chicago.

In addition to various fishes, mentioned elsewhere, the John G. Shedd Aquarium presented a Florida manatee. This was received in excellent condition, just after death, and served as the basis for a mold from which a reproduction in cellulose-acetate will be made, showing the animal in natural position. The skull and skeleton also were preserved.

By exchange, 108 mammals were received from the British Museum (Natural History), London, including many genera and species new to the collections. This material is from all parts of the world.

A very fine collection of unusually well-prepared specimens of large mammals from South Africa was received from the Vernay-Lang Kalahari Expedition. This consists of 197 specimens representing thirty-two species. Of outstanding interest is a giant sable antelope with horns of nearly record size, which is being prepared for exhibition. Other material from this expedition, including vertebrates of small and medium size, is expected in the near future, after it has been studied at the Transvaal Museum in Pretoria. A full account of the expedition appears in the Annual Report of the Director for 1930 (p. 347).

The 465 mammals obtained by the C. Suydam Cutting Sikkim Expedition form a very important addition to the Museum's collection, which contains but few of the many Indian forms. This material includes three genera not heretofore represented, and fifty-seven species most of which are new to the Museum. A large and handsome example of the Himalayan langur from this collection has been mounted and placed on exhibition in Hall 15.

Specimens from the Harold White-John Coats African Expedition, which were collected in 1930 but not accessioned until 1931, include choice specimens of the bongo and Hunter's antelope.

Specimens of Indian water buffalo and of gaur ox or seladang were received from the Carey-Ryan Expedition to Indo-China, which was conducted by Mr. George G. Carey, Jr., of Baltimore, and Mr. George F. Ryan of Lutherville, Maryland.

Among mammals purchased during the year was a collection of 122 specimens from Costa Rica, including types of two new species of rodents, which have been described in a Museum publication.

The most important accession of birds was the collection made by the C. Suydam Cutting Sikkim Expedition, totaling 1,379 specimens. Previously there were no specimens in the Museum from this far-off corner of India. Of special interest is the rare snow partridge (*Lerwa lerwa*), which was obtained at an altitude of 17,000 feet. Another interesting species from high altitudes is *Grandala coelicolor*, which is related to our common bluebird and resembles it in its azure plumage.

Also worthy of special mention is a collection of birds from Goyaz, Brazil, which was obtained by purchase. Included in it are the type specimens of two recently described birds, *Conopophaga lineata rubecula* and *Knipolegus lophotes maximus*. This collection is enriched further by many specimens that fill gaps in Field Museum's extensive series of South American birds, or that are new records for the region and therefore extensions of hitherto known ranges.

By exchange, 100 birds from various localities were received from Mr. H. B. Conover of Chicago. Most of these were new to the Museum's collections. Outstanding among them is *Grallaria gigantea*, largest of the South American ant thrushes, a passerine bird superficially resembling a quail or small partridge.

Notable gifts of amphibians and reptiles during 1931 include two specimens of the blind European cave salamander, received from Dr. Karl Absolon of Brünn, Czechoslovakia; two paratypes of a salamander, *Plethodon welleri*, from the Cincinnati Society of Natural History; 345 salamanders from the Great Smoky Mountains National Park, presented by Mr. D. C. Lowrie of the University of Chicago; fifty specimens from Mr. A. S. Windsor of the General Biological Supply House, Chicago; and thirty-four from Mr. Walter L. Necker of the Chicago Academy of Sciences, supplementary to the Great Smoky Mountain material. Mr. Robert M. Zingg of the University of Chicago collected and presented sixty specimens of amphibians

and reptiles from the Sierra Tarahumari in southern Chihuahua, Mexico. Dr. Charles E. Burt of Southwestern College, Winfield, Kansas, presented 173 specimens from Texas. The General Biological Supply House, Chicago, presented twenty specimens from various localities. The John G. Shedd Aquarium presented one tree frog, one Galapagos marine iguana and ten turtles, which include a specimen of the remarkable giant snapping turtle of the Mississippi. Gifts from members of Field Museum's staff amount to 143 specimens.

A single gecko from Aitutaki Island, Cook Islands, was received from the Philip M. Chancellor-Field Museum Expedition to Aitutaki (1930). The C. Suydam Cutting Expedition collected six frogs, fifty-nine lizards and thirty-nine snakes in Sikkim. These are of interest for comparison with other material in Field Museum's collections from southeastern Asia.

Exchanges with the University of Oklahoma, in return for identifications, added fourteen specimens from Oklahoma to the study collections. An exchange with the Senckenberg Museum, Frankfurt-on-the-Main, Germany, brought a paratype of the limbless lizard (*Voeltzkowia mira*) of Madagascar. Thirty-nine salamanders from North Carolina and Tennessee were obtained by exchange with the Cincinnati Society of Natural History. Two crocodilians preserved in alcohol and two South American turtles were received by exchange from the Museum of Comparative Zoology, Cambridge, Massachusetts.

Notable among purchases of reptiles and amphibians are forty-four specimens from southwestern Africa; five frogs from West Africa; forty-two specimens from Colombia; and 143 from Western Australia.

Five specimens of the ratfish, *Hydrolagus colliei*, were purchased from the Pacific Biological Laboratories, Pacific Grove, California, to be used for study purposes in the preparation of a specimen of the long-snouted chimaera of Japan for exhibition. Twenty-three specimens of rare fishes from the Gulf of Mexico were purchased from the Caribbean Biological Laboratories of New Orleans, to fill vacancies in the study series.

Twenty-three specimens of fishes from a region not previously represented in the Museum collections were received from the C. Suydam Cutting Expedition to Sikkim. From the Philip M. Chancellor-Field Museum Expedition (1930) to Aitutaki Island were received 210 specimens, including three that seem to be new to science. From the Cornelius Crane Pacific Expedition (1928-29) were received

3,850 specimens, including types and paratypes of a large number of new species. These had been temporarily in the custody of Leland Stanford University in California, which cooperated with Field Museum in the ichthyological work of this expedition.

From the John G. Shedd Aquarium were received seventy-six specimens in excellent condition. Several of these were used directly or indirectly in the preparation of exhibits. Most interesting was a series of four electric eels. These are being used in the preparation of study and exhibition material. It is hoped that from the lot there may be produced a mounted specimen, a mounted skeleton, a study skeleton of the head, and two study specimens.

The General Biological Supply House of Chicago gave twelve specimens of the guppy, *Lebistes reticulatus*, from St. Croix, Virgin Islands, and an egg of the nurse shark with a very large embryo. Captain R. J. Walters of the Miami Aquarium, Miami, Florida, gave a large scorpion fish and a large shark-sucker. The scorpion fish has been used in the preparation of a very excellent exhibition specimen that is already installed in the systematic series of fishes. The shark-sucker is being prepared for exhibition. A large tarpon in excellent condition was received from Mr. C. Irving Wright of Pirates' Cove Fishing Camp, Florida. A cast of the specimen was made in preparation for an exhibit to be produced later. Mr. P. B. Clark of San Francisco gave twelve specimens of the Alaskan black-fish. This fish is common in the fresh-water swamps of Alaska, but comparatively few have ever reached museums.

The fifty-six acquisitions of insects consisted mostly of small collections, two-thirds of which comprised species from various parts of North America. The largest gift was a series of 392 beetles from Idaho, presented by Mr. Emil Liljeblad of Chicago. From Mr. Bryan Patterson of Chicago there were received as a gift 154 desirable insects of various orders from Nebraska, a state from which the Museum hitherto had very few specimens. From the same state there were also acquired 144 miscellaneous insects collected by the Marshall Field Paleontological Expedition to Nebraska.

Much appreciated is a gift from Mr. Bernard Benesh of North Chicago, consisting of a rare beetle from Illinois, fifty-two insects of the same order from Arizona and California, thirty-four cockchafer from Germany, and seventeen named beetles, including two paratypes, from Uruguay. Dr. and Mrs. C. E. Hellmayr of Chicago increased the usefulness of the Museum's series of European insects

by presenting 226 specimens, mostly butterflies, which they collected in Bavaria and Switzerland.

A notable accession obtained by exchange with Dr. T. C. Schneirla of New York University is a collection of 244 identified ants representing thirty-five species from Illinois and the surrounding states. This is a much-needed addition to the collection of these interesting insects. An unexpected acquisition of 284 ticks was the result of an examination of the specimens of exotic toads, frogs, lizards, snakes, and turtles in the Museum's Division of Amphibians and Reptiles. As these annoying and harmful parasites deserve investigation, this lot, together with other ticks obtained previously, has been submitted for study and determination to Dr. Joseph C. Becquaert, of the School of Tropical Medicine of Harvard University.

The invertebrates other than insects received by the Museum during the year totaled 380 specimens. Of this number 217 were donations and 163 were obtained by Museum expeditions. A noteworthy acquisition was the gift of fourteen European and 184 North American sea urchins which were received from the Museum of Comparative Zoology, Cambridge, Massachusetts. These specimens have added value in that they are all authoritatively identified. Through the Philip M. Chancellor-Field Museum Expedition to Aitutaki Island in the Cook Archipelago, there were added to the collection 100 desirable specimens of various species of corals, twenty-one crustaceans, and twenty-seven other invertebrates. A small but important donation of two land shells from Professor T. D. A. Cockerell of the University of Colorado was of special interest in that the specimens are paratypes of a subspecies described by the donor.

DEPARTMENTAL CATALOGUING, INVENTORYING AND LABELING

ANTHROPOLOGY.—Forty-five of the fifty-six accessions received in the Department of Anthropology during the year have been entered. Fifteen accessions from previous years were also entered.

The work of cataloguing has been continued as usual, the number of catalogue cards prepared during the year totaling 4,554. The total number of catalogue cards entered from the opening of the first volume is 197,256.

The 4,554 catalogue cards prepared are distributed as follows: archaeology and ethnology of North America, 1,275; archaeology

and ethnology of Mexico, Central and South America, 898; archaeology and ethnology of China and Japan, 564; ethnology of India, 1; ethnology of Polynesia, 16; ethnology of Africa, 302; archaeology of the Near East, 4; prehistoric archaeology of Europe, 1,488; physical anthropology, 6. These 4,554 cards have been entered in the inventory books which now number fifty-seven volumes.

A total of 13,643 copies of labels for use in exhibition cases was supplied by the Division of Printing. These labels are distributed as follows: ethnology of North America, 1,152; archaeology of North America, 1,083; ethnology of the Southwest, 171; archaeology of Mexico, 208; ethnology and archaeology of South America, 903; ethnology of Melanesia, 3,263; ethnology of Polynesia, 247; ethnology of Malaysia, 6; Chinese jades, 5,029; archaeology of China (other than jade), 767; archaeology of Egypt, 119; archaeology of Kish, 6; ethnology of India, 6; busts of prehistoric man, 33; identification cards for skulls and skeletal material, 650. The Division of Printing also supplied the Department of Anthropology with 4,390 catalogue cards, 85 sketch maps for exhibition cases, 50 forms for archaeological surveys, and 120 numbers for exhibition cases.

The total number of photographs mounted in albums is 2,514. Eleven new albums were opened—one for China, four for Egyptian textiles, one for prehistoric man, one for the Field Museum Archaeological Expedition to the Southwest, one for the Marshall Field Archaeological Expedition to British Honduras (1931), one for Melanesian industries, one for types of men in the Irak army and Bedouins, and another for types of Arabs of the Kish area. To the label file 535 cards have been added.

BOTANY.—During 1931 cards were written and added to the catalogue of the Department library by the Librarian, Miss Edith M. Vincent, for the floras of the Arctic regions, Canada, the United States, Europe, Asia, Africa, Australia, Hawaii, the East Indies, and other Pacific islands. A list was made of the duplicate books and pamphlets in the library of the Department for use in disposing of them by sale or exchange.

More than 5,000 cards were received from the Gray Herbarium of Harvard University in continuation of the index of new species of American plants. These were inserted by the Librarian in their proper places in the file of cards which composes this indispensable index. The Librarian also kept up to date the Department records of accessions, exchanges, and loans, besides preparing indexes for two

volumes of the Botanical Series of Field Museum, and compiling a great amount of bibliographic data for the use of the staff of the Department.

More than 1,500 index cards to the literature of tropical agriculture were received this year from the Institute Colonial de Marseille, Marseilles, France, and the cards of this catalogue now number 7,816. They have been sorted and filed by Assistant Curator James B. McNair.

The Custodian of the Herbarium, Mr. Carl Neuberth, maintains a card catalogue of the contents of the Herbarium, from which there may be obtained in a few moments information regarding any collector whose plants are in the collections, or the extent to which any country's flora is represented in them. This collector index now contains 11,970 cards, with the names of almost as many collectors whose work has contributed to the Herbarium. To this catalogue 159 cards were added during 1931. The geographical index consists of 3,151 cards, of which twenty-nine were added during the past twelve months.

During the year 20,469 sheets of plants and photographs were added to the permanent collections of the Herbarium, in which the total number of mounted specimens is now 642,720. For the herbarium specimens acquired during the year it was necessary to write several thousand labels, and other labels had to be written for duplicate specimens sent out in exchange. There were prepared type-written data to accompany the sets of photographic prints from type negatives which were dispatched to various institutions.

The work of cataloguing wood specimens has continued. Descriptive labels for the various species installed in the Hall of North American Woods were prepared and placed with the respective exhibits. Descriptive labels were written, also, for the specimens placed on exhibition in the Hall of Foreign Woods (Hall 27). More than 2,000 specimens obtained in Peru by Assistant Llewelyn Williams were labeled and placed in the study collection of woods.

All economic material, other than woods, received during the year was accessioned and catalogued by Assistant Curator McNair. Most of this material has been stored by him in its proper place in the study and reserve collections.

The poisoning, bottling, labeling, and cataloguing of economic botanical specimens has been continued as described in the Annual Report of the Director for 1928 (p. 473).

Descriptive labels were written by Mr. McNair for various exhibits in Hall 28. These comprised general and detailed descriptions of the fibers of pineapple, sedges, rushes, grasses, bananas, screw-pine, cat-tail, raffia, pine, cedar, and fir. Others were written for exhibits of baskets, brushes, and brooms, straw hats, tans, and dyes, tobacco, cork, corn products, and paper.

The card file of copies of the labels in the exhibition halls has been continued by Mr. McNair, and the office files of labels for the economic specimens on display is complete to date, including all printed during the year.

To the albums of the Department 107 photographs were added.

GEOLOGY.—The number of specimens catalogued in the Department of Geology during the year was 2,050, making the total number of departmental catalogue entries 189,408. The additions of systematically grouped minerals numbered 606 and those of fossils 962. Other entries related to a variety of specimens. Previously entered specimens to the number of 272 were withdrawn for exchange or were discarded, and notations of the withdrawals were made in the catalogues against the entry number of each. Additions to the card catalogue of vertebrate fossils numbered forty.

Labeling has consisted chiefly in substituting buff cards for those of black color previously used, although a considerable number of new labels have also been prepared. The change from black to buff cards has necessitated rewriting many of the labels and reprinting all of them. Also, as a result of the reinstallation of more than one hundred cases during the year, it was often necessary to change the size as well as the text of the labels. Altogether, copy for 1,936 labels was prepared. Seventy-six of these were descriptive labels prepared for the reinstalled cases in Skiff Hall. A total of 2,425 labels was received from the Division of Printing and installed. Of these, 988 were for Skiff Hall exhibits, 786 for minerals and meteorites, and 129 for exhibits in Stanley Field Hall. A total of 528 labels which have not yet been printed was written. For immediate use until the printed labels were received, 148 temporary labels were prepared and installed. For the group of titanother restorations and the Carboniferous swamp forest, illuminated labels were prepared and installed. Labeling of the mural paintings in Ernest R. Graham Hall was completed.

New photographic prints added to the Department albums during the year numbered 242. Typewritten labels were provided

for all of these. The total of album prints in the Department now mounted and labeled is 7,378. Eighty-four topographic maps of the United States Geological Survey were received during the year and filed with descriptive labels attached. With those previously recorded, a total of 3,416 of these maps is now available.

ZOOLOGY.—Zoological specimens to a total of 12,275 were numbered and entered in the departmental catalogues. They were distributed, by divisions, as follows: mammals, 1,636; birds, 8,469; reptiles and amphibians, 885; fishes, 1,242; skeletons, 43.

About 1,000 skulls of mammals were numbered and labeled, and 300 cards were added to the index of the mammal collection. Old-style black exhibition labels for mammals were entirely replaced with buff labels. Labels for all new or reinstalled exhibits have been prepared, including a complete revised set with maps for all habitat groups of birds and thirty labels for exhibition reproductions of reptiles and amphibians.

The card index of the genera and families of recent fishes has been completed, except for a few recent names, and now totals 6,600 cards, which afford a ready means of finding specimens in the systematic collection.

All accessions of insects for the year were pinned, labeled, and distributed.

A large increase in the Department's files of photographic prints was made, amounting to 3,290 prints in six new albums.

The state of the catalogues at the end of the year is as follows:

	Number of record books	Total of entries to Dec. 31, 1931	Entries during 1931	Total of cards written
Department of Anthropology.	57	197,256	4,554	201,376
Department of Botany.....	63	655,287	33,627	16,471
Department of Geology.....	26	189,408	2,050	7,144
Department of Zoology.....	47	166,721	12,275	42,103
Library.....	17	80,504	2,843	404,602

INSTALLATIONS AND REARRANGEMENTS

ANTHROPOLOGY.—The main efforts of this Department during 1931 were directed toward the installation of Mary D. Sturges Hall (Hall 3) devoted to North American archaeology, and the completion of the Jade Room (Hall 30). A noteworthy beginning was made in the reinstallation of Joseph N. Field Hall (Hall A), and many additions and improvements were made in almost all other halls of the Department.

A total of seventy-three exhibition cases was installed or reinstalled during the year, distributed as follows:

	Cases
Egypt (Hall J).....	5
Joseph N. Field Hall (Hall A).....	7
Polynesia (Hall F).....	4
Arthur B. Jones collection (Hall G).....	1
Stanley Field Hall.....	4
Mary D. Sturges Hall (Hall 3).....	17
James Nelson and Anna Louise Raymond Hall (Hall 4).....	3
California and Southwest Nomadic Tribes (Hall 6).....	7
Mexico and Central America (Hall 8).....	4
South America (Hall 9).....	2
Eskimo and Northwest Coast Ethnology (Hall 10).....	5
Chinese Jade (Hall 30).....	8
Models of pagodas (South Gallery).....	5
Ethnology of China and Tibet (Hall 32).....	1
Total.....	73

The installation of Hall J, devoted to the archaeology of ancient Egypt, may be reported as complete. Two large built-in cases along the south wall of the hall were installed this year. The brilliantly ornamented Egyptian textiles, which had been mounted and stretched on frames at the end of 1930, now occupy eight large sections of a built-in case along the south wall. The greater part of the textile exhibit, including specimens previously installed in the case on the north wall, belongs to post-Christian centuries. During the so-called Coptic period, chiefly in the first millennium after our era, Hellenistic and Western Asiatic art influences mingled with those of ancient Egypt to produce the varied patterns which make this a collection of treasures for the modern designer. Some inscribed and decorated mummy wrappings of the pre-Christian era are included in the exhibit.

In the case at the west end of the south wall have been placed fifty Egyptian tombstones or memorial tablets, ranging in date from the Middle Kingdom (about 2000 B.C.) to the Coptic period. The compartment above them has been used to display further examples of Egyptian sculpture or craftsmanship in stone, partly originals and partly casts, from tomb and temple walls still standing in Egypt.

A beginning was made toward the end of the year with the reinstallation of Joseph N. Field Hall (Hall A) which contains the most comprehensive known collection of Melanesian ethnological material. So far seven cases of very beautiful wood carvings and other specimens from New Ireland have been reinstalled on buff-colored screens.



MOUNTED SKELETONS OF FOSSIL SOUTH AMERICAN GROUND SLOTH (*Scelidodon*)

Ernest R. Graham Hall (Hall 38)

Marshall Field Paleontological Expedition to Bolivia, 1927

Height of erect animal, eight feet; length of burrowing animal, nine feet

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In Hall F (Polynesia and Micronesia) four cases containing Maori robes, wood carvings, jade ornaments, and utensils were reinstalled. The old-style black labels were replaced with buff cards in black type in twenty-one cases of this hall, and also on the Maori council-house.

A miniature group representing a village of the Menangkabau, a Malayan tribe of Sumatra (in Hall G, Arthur B. Jones collection), was completed this year. Data for this group were collected by Dr. Fay-Cooper Cole, now of the University of Chicago, while on the Arthur B. Jones Expedition to Malaysia, 1922-23. The modeling was done by Mr. John G. Prasuhn, and the painted background is the work of Staff Artist Charles A. Corwin. The model is illustrated in Plate VIII of this Report.

Four cases in Stanley Field Hall, containing Sung porcelain from China, gold ornaments from Colombia, jewelry from India, and busts of prehistoric man, were reinstalled with new buff labels. The case of Sung porcelain (Case 6) was entirely rearranged. To Case 11 in Stanley Field Hall were added gold earrings and a lapis-lazuli head from Kish. The latter represents a typical Sumerian head of the fourth millennium before our era. It is probably the tiniest bit of sculpture ever made, and a magnifying lens has been placed in front of it to make possible a better study of its fine details.

In Edward E. and Emma B. Ayer Hall (Hall 2) the backgrounds of two cases containing Roman frescoes from Pompeii were repainted in light colors and provided with labels in the new style.

Seventeen cases of North American archaeological material, and an actual size model of an Illinois mound-builder's grave have been placed on exhibition in Mary D. Sturges Hall (Hall 3). Most of the objects installed in the cases are of stone, but objects of bone, wood, shell, copper, and pottery are likewise exhibited. It is customary to divide prehistoric North America into twelve culture areas. This classification has been made on the basis of similarity of traits; for example, pottery, weaving, stone and copper artifacts, burials, and houses. The main object of Hall 3 is to illustrate the prehistoric cultures of these different areas (excepting that of the Southwest, which is shown in Hall 7). With this end in view, the material has been chosen to illustrate the development, skill, and resourcefulness of the Indians of each region.

The culture areas represented are: Mississippi-Ohio, South Atlantic, North Atlantic, Iroquoian, Great Lakes, Columbia-Fraser, North Pacific Coast, and California. The exhibits have been

labeled with reference to these areas and also sublabeled, so far as possible, according to the more familiar, political state boundaries; for example, the state of Illinois comprises two distinct cultures, one in the northern and another in the southern portion. The case label, accordingly, reads, "Archaeology of the Great Lakes Area, Northern Illinois." In this manner, the layman, even though he may be unfamiliar with the conceptions of the archaeologist, nevertheless can easily find the region in which he is interested.

As the archaeology of Illinois is of great local interest, the cases devoted to that region have been placed at the west end near the entrance to the hall. To the right of the west entrance stands the model of an Illinois mound which is shown partially excavated (see Plate III of this Report). In the foreground is shown a typical burial with the accompanying grave furniture, consisting of pottery, beads, shell spoons, and stone artifacts. The skeleton and accessories for this group were contributed by Dr. Don F. Dickson of Lewistown, Illinois (see p. 105). To the left of the west entrance is a typological exhibit containing the various types of stone and copper artifacts, ornaments, and pottery, and showing by means of maps the distribution in North America of each. An idea of this new method of installation followed in Hall 3 may be obtained from Plate XVI of this Report, which shows painted pottery from burial mounds of Arkansas.

Three cases illustrating the ethnology of the Naskapi of Labrador were added to James Nelson and Anna Louise Raymond Hall (Hall 4). They contain clothing, weapons, hunting and fishing implements, means of transportation, charms, and ceremonial objects collected by Dr. William D. Strong, former Assistant Curator, during the Second Rawson-MacMillan Subarctic Expedition, 1927-28. The installation of Hall 4 has been completed.

Seven newly installed cases were placed in Hall 6. These illustrate the cultures of the Thompson River, Wasco, Klikitat, Yakima, and Skokomish Indians by means of buckskin garments, bags, baskets, tools, weapons, ornaments, and ceremonial objects.

One case of archaeological material representing the Highland Maya culture of Guatemala was installed and placed on exhibition in Hall 8. Most of the objects in this case were collected by Assistant Curator J. Eric Thompson as leader of the Second and Third Marshall Field Archaeological Expeditions to British Honduras. A case of Costa Rican archaeological material, chiefly pottery, was also installed. Three cases were removed from Hall 8, and the material

in them, representing the civilization of the Toluca Valley of central Mexico, was reinstalled in two screen cases. A previously installed case of Nicaraguan archaeology was labeled.

Two cases of newly installed material have been added to Hall 9. In one of these is displayed a representative collection of the fine Nazca pottery of southern Peru, collected by Dr. A. L. Kroeber, Research Associate in American Archaeology, while leading the First and Second Marshall Field Archaeological Expeditions to Peru. The other case displays ethnological material collected in Colombia by Dr. J. Alden Mason, former Assistant Curator, as leader of the Marshall Field Archaeological Expedition to Colombia. Five cases previously installed in this hall were labeled.

In Hall 10 five cases were reinstalled on light-colored screens. These illustrate the ethnology of the Chinook, Cowichan, and Puget Sound Salish of the Northwest Coast of America. A loom and textiles, wood carvings, utensils, baskets, and ceremonial objects are included in this exhibit. It is planned to proceed with the reinstallation of this hall in the coming year.

On October 31 the Jade Room (Hall 30) was opened to the public. About 1,200 jade carvings are installed in chronological order in eight cases, individually lighted. In each case a flowered yellow silk, woven on a hand-loom at Lyons, France, after a Chinese sample of the K'ien-lung period, has been used as background. Each case contains a general descriptive label which sets forth the characteristic features of the period in question. In addition, there are smaller labels for groups of objects or individual pieces. A total of 717 stands were carved as supports for the jades. A number of the objects in this room were received as far back as 1899 as a gift of the late Mr. H. N. Higinbotham, but the foundation of the collection was laid by the Blackstone Expedition to China, 1908-10, under the leadership of Dr. Berthold Laufer, Curator of Anthropology, who was the first to collect the archaic jades of China and to study and interpret them. Many additions to the collection were made by him in 1923 during the Marshall Field Expedition to China. In 1927 the Bahr collection of Chinese jades was acquired by the Museum with a fund to which Mrs. George T. Smith, Mrs. John J. Borland, Miss Kate S. Buckingham, Mr. Martin A. Ryerson, Mr. Julius Rosenwald, Mr. Otto C. Doering, and Mr. Martin C. Schwab contributed. Other objects were presented by individuals, among whom Mrs. William H. Moore, the late Mr. Richard T. Crane, Jr., and Mr. J. A. L. Moeller are prominent. An imperial yellow silk

tapestry, decorated with nine dragons, has been hung on the wall of this room, and its color harmonizes well with that of the silk used in the exhibition cases. The tapestry was presented to the Museum by the American Friends of China, Chicago.

The models of Chinese pagodas have been rearranged and provided with new and revised labels. Twenty-six Chinese paintings were hung in the South Gallery. A case of Chinese tobacco pipes in Hall 32 has been reinstalled.

A study room (Room 55) located opposite the Department library was completed and opened this year. It is well lighted and well equipped with tables and chairs for the use of students, many of whom availed themselves of the opportunity presented. Three of the walls are lined with cases containing collections arranged in geographical order. Among these are a selection of American Indian baskets; pottery of Mexico and Peru, including an instructive series of modern forgeries; bronzes and ceramics of China; wood carvings and other material from Japan; brasses, pottery, and metal stamps for textiles from India; string bags and wood carvings of Melanesia; a large variety of African objects; and ancient Egyptian fabrics. An alabaster model of the Taj Mahal occupies the center of the room. The material in the cases has been specially selected with reference to the needs of designers. It is accessible to all students who are seriously interested. Material in storage rooms can also be made available to students if proper notice is given in advance.

Under the plan of cooperation with the University of Chicago study material was largely used by the professors and students of the Oriental Institute, Department of Anthropology, and Department of Art of the university.

The cooperation of the university with the Museum is best illustrated in the collections of Egyptian archaeology. Professor James H. Breasted, Director of the Oriental Institute, has always rendered generous assistance to the Museum in securing valuable collections, identifying material, and translating Egyptian inscriptions. In 1927 Professor Breasted obligingly consented to grant the Museum the part-time services of Dr. T. George Allen for the purpose of installing and labeling the Museum's Egyptian collections. Dr. Allen, who was appointed Assistant Curator of Egyptian Archaeology in 1927, acquitted himself of this task in the most creditable manner, and the Egyptian hall is now well arranged and labeled.

Miss Elizabeth Stefanski of the Oriental Institute published, under the supervision of Assistant Curator Allen, descriptions of



SCORPION FISH

Albert W. Harris Hall (Hall 18)

Reproduced by Arthur G. Rueckert from specimen presented by Miami Aquarium

About two-fifths actual size

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several inscribed and decorated mummy-wrappings included in the Museum's exhibit of Egyptian textiles (*American Journal of Semitic Languages*, Vol. XLVIII, pp. 45-50). Dr. Allen completed a manuscript describing and translating the fifty Egyptian tombstones which are now on exhibition in the Egyptian hall.

The archaeological material from Kish has proved a constant attraction to Dr. Albert T. Olmstead, professor of ancient history at the Oriental Institute, and his students, who have come several times to study it. Miss Lucy C. Driscoll, professor of the history of art at the university, brought her students occasionally to discuss and study Chinese paintings and jades.

Dr. George Herzog, a student in the department of anthropology at the University of Chicago, transcribed dictaphone records of drum music and songs of the Ovimbundu of Angola, taken by Assistant Curator W. D. Hambly while leading the Frederick H. Rawson-Field Museum Ethnological Expedition to West Africa. Mr. C. P. Watkins, a student in the same department, studied linguistic records from the same tribe and prepared a short paper on the tones and syntax of the Umbundu language.

Dr. Gerhardt von Bonin, associate in anatomy at the University of Illinois, continued his anthropometric study of skulls from New Britain, and assisted in the restoration of the Cap Blanc Magdalenian skull and in measurements of all bones of the Cap Blanc skeleton.

In the Department's carpenter shop, thirty new screens, forty-four bases, and 168 frames were turned out.

In the modeling section of the Department the Menangkabau village group and a restoration of the Mitla temple model were completed by Modeler John G. Prasuhn. He likewise modeled and constructed the grave of the mound-builder from Illinois, and modeled and cast twenty-one Eskimo heads to be used in connection with an exhibit of Eskimo costumes. In addition, Mr. Prasuhn made a small working model of an Indian copper mine, made casts of four Chinese jade seals and of a mold from Guatemala, treated an Egyptian bronze cat by means of the electrochemical process, made a plaster bed for a neolithic skeleton, and repaired two Cliff-dwellers' models, a model of Stonehenge, and the plaster figure of an African medicine-man.

There were 276 objects treated, repaired or restored in the Department's repair shop. These comprise two antiquities from Egypt, forty-nine from Kish, seventy-seven from China, forty-nine

from America, two from Melanesia, fifty-three from Europe, and forty-four bones. Five hundred stands for jades were also made in the repair shop.

Numbers marked on specimens totaled 16,282. Material in twenty-two exhibition cases was poisoned. Material stored in the poison room on the fourth floor was cared for in the usual manner and is in excellent condition.

Stored material in Room 28, consisting of duplicate objects available for exchange, was rearranged. Skulls and skeletal material were moved from Room 35 to Room 39 which is now assigned to physical anthropology. The material is permanently housed there in six steel-encased cabinets provided with identification labels. Room 36A is set aside for the archaeological material from Kish, Room 30 for ethnology of the Northwest Coast of America, Room 31 for material from Africa, Room 33 for material from India, Room 34 for Mayan archaeology and South American ethnology, Room 35 for Melanesian ethnology, and Room 36 for ethnology of the Philippines and Malay Archipelago. Room 66 has been equipped with seven steel racks, on which Chinese material has been rearranged. A section in the northwest corner of Work Room 38 has been partitioned off and fitted with steel shelves. The repair shop now located in Room 29 will be transferred there, and Room 29 will be provided with storage racks for study material.

BOTANY.—The studies on Carboniferous plants and the material accumulated incidentally to the work on the Carboniferous forest group for Ernest R. Graham Hall of Historical Geology (Hall 38), have enabled the Department of Botany to make some important additions also to the exhibits in the Hall of Plant Life (Hall 29).

The Lycopods or clubmosses were formerly represented there only by specimens of the small modern ground pines and selaginellas, with a few fossil specimens to indicate the existence of extinct members of this order. To these it has now been possible to add reconstructions of some of the extinct representatives of this order. There have thus been added to the former exhibit two restorations of fertile branches of *Lepidodendron*, showing in detail the dichotomous branching, the sculptured surface pattern, the grass-like foliage, and the spore-bearing cones of large size, which distinguished the clubmosses of this genus. With them has been placed a small-scale model of an ancient clubmoss tree and a reconstruction of a five-foot length of the trunk of a *Sigillaria*. The result is a

different and much more adequate representation of an order of plants at present relatively insignificant, but formerly of great importance as they once constituted a large if not the principal part of the land flora of the world.

Other classes and orders of nonflowering plants entirely absent from the present-day vegetation, or existing now only as a dwindling remnant of a once magnificent development, are similarly being added to the exhibits in the Hall of Plant Life (Hall 29). Such are the Equisetums or horsetails, the Cycadofilices or seed-bearing ferns, the Cordaites, the primitive conifers of Paleozoic time, the Cycadeoids of the Mesozoic, etc. Reconstructions of a plant of *Sphenophyllum* (*S. emarginatum*) and of a seed-bearing branch of *Cordaites* (*C. borasifolius*) have thus recently been installed in their appropriate places in the botanical exhibits. These reconstructions have been prepared in the Stanley Field Plant Reproduction Laboratories.

Botanical classifications usually pay scant attention to whole classes and orders of plants that have become extinct. It is often forgotten that the present-day vegetation represents in part the survival of vegetation of the past, and in part the end products of a long line of evolution, some of relatively recent time. For an understanding of modern vegetation, a knowledge of that which has preceded it is important. The exhibits in the Hall of Plant Life, bringing together, as they do, a large assemblage of interesting plants from all parts of the world, are at the present stage far from complete, but even now they offer the most extensive Museum display of plants in existence. With the inclusion of a selected number of restorations of outstanding extinct types, for some of which almost perfect data exist, the botanical exhibits will become much more truly representative of the plant kingdom as a whole than if the extinct groups were disregarded.

The liverworts and true mosses in this hall have recently been reinstalled to great advantage, and space has thereby been released for a more adequate treatment of the fungi, shown at present especially by a number of common mushrooms.

From material obtained in Pará by members of the Marshall Field Botanical Expedition to the Amazon in 1929, there has been reproduced for the Hall of Plant Life a branch of *Bixa Orellana*. This handsome tropical shrub or small tree is best known as the source of the yellow coloring matter employed for improving the appearance of dairy butter and imparting color to its substitutes. It is less generally known that it is commonly used by the South

American Indians for painting their bodies. The color is obtained from the seeds which in certain places form an important article of commerce. With its characteristic red-veined leaves, its pink flowers, and its bright red prickly pods, which are probably responsible for its Indian name "Urucú" (red), the arnatto makes an interesting addition to the number of useful plants already represented in this hall. The specific name of this plant recalls one of the most adventurous characters in the history of the European occupation of South America, the Spaniard Francisco de Orellana, who was the first white man to descend the entire length of the Amazon in futile search of the city of Manoa. The brilliant color of the plant extract of this Amazonian species may be presumed to have suggested to the botanist responsible for the name the golden hallucinations of the Spanish adventurers among whom Orellana is an outstanding type.

A less exotic addition to the exhibits of recent date in the same hall is a handsome reproduction of a branch of a tulip tree. It was prepared from material obtained in Indiana. This splendid North American forest tree, related to the magnolias, has a wide distribution in the states to the south and east of Illinois and approaches its northern limit in this region. The specimen is designed to be placed eventually in Charles F. Millspaugh Hall (Hall 26, North American Woods) in connection with the display of the trunk and wood of yellow poplar, under which name it is generally known commercially.

With resumption of active work on exhibits in this hall the black labels are gradually being replaced with light-colored ones to conform with the now generally prevalent color scheme in the Museum. In connection with this the opportunity is being taken to rewrite many of the case labels and to revise carefully all others.

The installation of the economic botanical exhibits in Hall 28 has been continued during the year by Assistant Curator James B. McNair. Additional reinstallations were made of the various fibers and fibrous plants that serve as raw material for the textile and kindred industries. The list for the year is essentially as follows: longleaf pine and other coniferous fibers, raffia, manila hemp, sedges, grasses, sisal, rushes, and bamboo, almost all of which are used for rope and twine as well as for mats and textiles.

Some entirely new exhibits have been added to these. Various other fibrous materials find application in certain fundamental industries common to humanity in all stages of cultural development. Such are the basketry, brush, and broom materials. The many

kinds of plant material used for straw hats belong in the same category.

The basketry material has been arranged in three groups: (1) the principal commercial products of willow, rattan, bamboo, and mucroo; (2) baskets constructed of miscellaneous materials, such as fern stems, seaweeds, manila hemp, akebi vine, sedge, grass, grape, cane, and palm; and (3) baskets made by North American Indians, such as those of pine needles, yuca leaf fiber, sumac, willow and hazel twigs, rushes, cat-tail flags, and spruce roots. In industrial importance the four materials in the first group stand out above all others: twigs of willows and the stems of the slender rattan palm are used especially in Europe and North America; mucroo, the stem of a marantaceous reed, is peculiar to South America; and bamboo, the woody stem of a giant grass, furnishes the most popular basket material of the Orient.

Brooms represent an industry almost as primitive as basket making, and one case is devoted to various forms of brushes and brooms made of a large variety of materials. Emphasis is given to those used in the United States, including the ordinary house broom and whisk broom of sorghum. There are scrubbing brushes of Mexican grass roots, palmyra and other palm fiber, the white-wash brush of coconut-husk fiber, and coarse street brooms of piassaba, African bass, and sugar-palm fiber.

An exhibit of the plant materials commonly used for hat making shows that many different plant stems and fibers of widely different origin are used for this purpose in various parts of the world, e.g.: splints from the stems of bamboo and rattan; strips from the leaves of screwpine, palmyra, and other palms; fiber from the young leaves of the so-called panama hat palm which is a near-palm; wheat straw, spruce roots, and manila hemp. The most common type of straw hat in the United States is made of wheat straw in some form, and one half of a case has been given over to the varieties of this well-known article of common use so popular during a part of the year. Another half-case shows the material and various stages in the weaving of panama hats. Photographs in the exhibit portray the panama hat plant, the weaving of a panama hat, and the manufacture of hats in Italy. The exhibit includes many other common types of hats, such as leghorn, balibuntal, baku, yeddo, bamboo.

The cork and cork products exhibit is much more attractive as reinstalled on its light background than on the black of the old installation. This exhibit shows vertical and horizontal cross sec-

tions of the cork oak tree in typical stages of growth, the separated cork layer, and various products, from pen holders to life preservers, made of cork.

Another near-by exhibit, the tans and dyes, likewise includes forms of bark. Among dyestuffs are many which have been in common use throughout historic time, such as the well-known henna, indigo, madder, turmeric, catechu, and Persian berries. Other materials displayed are brazilwood, logwood, fustic, cochineal, and arnatto, used for many centuries by American Indians, who introduced them to Europeans. While the use of artificial dyes, especially from coal tar, has reduced the importance of natural dyestuffs, many of them still find application, and those no longer widely employed have a value in demonstrating the coloring matters produced by plants, and in showing plants used for dyeing by ancient and aboriginal peoples such as the ancient Egyptians, Peruvians, and North American Indians. The employment of harmless plant dyes for coloring foods, oils, cosmetics, and other such products is becoming more widespread.

The exhibit of tanning materials includes hemlock bark, quebracho wood, gambier, mangrove bark, sumac, myrobalan nuts, valonia acorns, and other plant products.

An alcove consisting of two vertical cases with a table case between has been given over to a display of tobacco. This exhibit shows the principal cigarette, cigar, chewing, and pipe tobaccos from many parts of the world, as well as forms of tobacco seldom encountered. Unusual cigarettes and cigars from many countries are shown, including Brazil, Mexico, Peru, Japan, and Siam.

Fiber plants have long been useful to man in the manufacture of mats and clothing; comparatively recently they have become equally important in paper making. The fast-growing paper-making industry makes use of many kinds of plants and several exhibition cases have been given over to the plants processed for paper pulp. Many herbs, shrubs, and trees are made to yield this material, the plants thus utilized including grasses, cotton, flax, hemlock, pine, and spruce.

Several years ago the edible products from corn were installed in Hall 25. Now the fibrous and other inedible products from the corn plant have been arranged in Hall 28. All parts of the corn are found to be capable of useful application. Wall board and paper are made from the leaves and stalks; cigarette papers and tamale wrappers from the husks; distillation products, charcoal, and pipe

bowls from the cobs; and fermentation products such as butyl and amyl alcohols from the kernels.

In continuation of the work begun early in 1929, satisfactory progress was made during the year in the reinstallation of available specimens of the principal species of North American trees in Charles F. Millspaugh Hall (Hall 26). Of the eighty-four species selected to complete the series, sixty-nine are now installed.

The following ten species have been placed on exhibition during the year: longleaf pine, western hemlock, Douglas fir, Monterey cypress, red mulberry, black locust, sugar maple, basswood, black gum and tupelo. Photographic enlargements to accompany some of these were made from prints kindly loaned by the United States Forest Service.

Specimens of various other species intended for the same hall are on hand as follows: western larch, western red cedar, tamarack, sycamore, southern white cedar and paper birch. These were generously furnished by individuals and concerns associated with the lumber industry and will be placed on exhibition as soon as the specimens are sufficiently dry.

Considerable progress was made with the exhibits in the Hall of Foreign Woods (Hall 27). The black backgrounds have been eliminated as far as possible and many specimens and whole exhibits have been retired to the study collections to make room for new ones. The best of the foreign wood exhibits have been or will be reinstalled in the hall, e.g. the remarkable Japanese collection, the Australian and New Zealand woods, etc. In view of the impossibility of showing all the woods of every foreign country, attention is being given first to the representation of those species that have assumed commercial importance in the trade of the United States and are thus of special and immediate interest in this country.

Of the reinstallations completed, one of the most attractive is the case in which are displayed large boards of Paraná or Brazilian pine, and embuia, the two most important timber trees of southern Brazil. Enlarged photographs, showing the trees in their natural environment, add to the interest of the exhibit.

The table-top made of a single board roughed out of the buttress root of Andaman padauk was hand polished and reinstalled. The addition of veneered panels of East Indian rosewood and Andaman padauk, placed on each side, affords an opportunity for a comparison of these woods.

A series of twenty-four boards of the principal woods of the lower Amazon Valley was placed on exhibition. These specimens were secured in Pará by the Marshall Field Botanical Expedition to the Amazon, and are of unusual interest in that they show the wide variation in color, density, and other features displayed by the woods of that region.

Eleven boards of the principal commercial woods of Argentina, and a wheel section of the famous tannin-yielding quebracho, have been installed in cases adjoining the Brazilian collection.

Another attractive exhibit is the series of twelve veneered panels representing important timber trees occurring in Madagascar and on the west coast of Africa. Many of those shown have become known in the American market only during the last few years, while a few of them are practically unknown.

Installation of the European woods in the section of the hall set aside for them has been inaugurated with the placing on exhibition of panels of Circassian, French and English walnut, English brown oak, Italian olive and sycamore-maple.

Many panels of other European, African and Indian woods are on hand, ready to be added to the foreign wood exhibits. Preparations have been made to reinstall the Museum's collection of Australian woods. The large planks have been planed and hand polished and these will eventually be placed on exhibition in the Hall of Foreign Woods.

As in previous years, Professor Samuel J. Record, the Museum's Research Associate in Wood Technology, spent a month at the institution, working on the collection of Peruvian, Brazilian, and Paraguayan woods and other material in the study series. In addition, he supervised the work of installing new specimens in the Hall of Foreign Woods and formulated plans for the arrangement of others when they become available. He also prepared labels for several exhibits of North American woods in Charles F. Millspaugh Hall, as well as for the various panels of African and Indian woods placed on exhibition during the year.

A recent issue of the *American Lumberman* carried an illustrated article about the Museum's wood exhibits. Various organizations and individuals have expressed an interest in the foreign woods and have signified a willingness to furnish many specimens now lacking. These will become available as soon as they have been prepared or procured from their countries of origin.



GRANADILLA (*Passiflora quadrangularis*)
(Hall 29)

One of the large-fruited Passionflowers of the American tropics. Reproduced in Stanley Field Plant Reproduction Laboratories, Department of Botany, from material obtained by the Stanley Field Guiana Expedition

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During 1931 the collections of the Herbarium have increased in a most satisfactory and encouraging manner. Its permanent scientific value and importance have been enhanced by the large amount of tropical American material added to it, with a corresponding increase in the number of species available for study. Of greatest importance in the progress of the Herbarium has been the insertion of many thousands of photographs of type specimens from European herbaria, the majority of which represent species new to the collections, and for the most part species lacking in other American herbaria.

The Museum Herbarium now contains more than 642,000 mounted sheets of plants, representing the floras of every region of the earth, but most fully those of North and South America. There are in storage, awaiting mounting, probably 100,000 additional specimens, the majority of which are from the Old World. There are arrears, also, of American plants, for it has been impossible to prepare for the Herbarium all the tropical American collections as rapidly as they have arrived during the past two years.

The plant mounter, with the aid of an assistant for a part of the year, has prepared for incorporation in the Herbarium, by gluing and strapping, 21,620 specimens of plants. This number includes some thousands of photographs which were mounted with their labels upon herbarium sheets and stamped so that they could be distributed into the study series. The work has been done most efficiently, as a result of long years of experience, and it is safe to say that in no herbarium are the plant specimens better or more enduringly mounted than in Field Museum.

The output of mounted plants would have been greater if the time of the mounter had not been used for other necessary purposes. All lots of specimens received were fumigated promptly in order to destroy any insects lurking in them, and prevent their introduction into the Herbarium, where they could cause serious damage. The Herbarium in recent years has been gratifyingly free of insects, for only in one or two instances have beetles been found. In the general Herbarium no beetles have been seen during the past four years.

The plant mounter prepared 18,000 packets for attaching loose material to the sheets on which specimens are mounted. He also packed for shipment no less than 171 lots of plants. Some of these consisted of only one or two small specimens, but others comprised hundreds of them, which had to be counted, wrapped, and packed

in boxes or other containers, often in such form that they could be shipped safely to distant countries.

The Custodian of the Herbarium, Mr. Carl Neuberth, was absent upon vacation and leave for three months of the year, but he kept the Herbarium in perfect order. All lots of mounted plants were distributed as quickly as they came from the mounting room, a degree of efficiency seldom encountered in herbaria, in many of which mounted plants sometimes accumulate for several years before being distributed and thus made available for study. Specimens of unusual importance arriving at Field Museum sometimes are filed in the Herbarium the same day that they are received.

The work of the Custodian was increased by the installation during the year of six additional steel herbarium cases, to accommodate the growth and rearrangement of the collections. This necessitated the shifting of a large part of the main Herbarium, with a consequent preparation of new case labels. Three of the cases were placed in the general Herbarium, and three others in Room 4 which is adjacent to the Department library. To Room 4 was transferred the Illinois herbarium, previously stored in temporary cases in a less accessible part of the building. The collections of lower plants, with the exception of the Harper collection of fungi, were also moved to this room. In Room 4 there are now six steel unit cases which accommodate admirably all the collections assigned to this location. Being spacious and well lighted, the room is a most agreeable and comfortable one in which to work. There are stored in it in temporary cases a part of the Peruvian collection which is being kept separate from the general Herbarium until no longer needed for study. Also stored there are the Peruvian duplicates that are awaiting distribution.

The distribution into the Herbarium of so many sheets involved the writing by the Custodian of hundreds of new genus and species covers. The Custodian also devoted a great deal of time to rearrangement of the Herbarium, excluding synonymous names, and bringing together in one place all material of a given genus or species.

The Herbarium is now in an enviable condition so far as order and accessibility are concerned. Practically all the Museum's plant collections are arranged in a single sequence, making all specimens immediately available for examination.

The staff of the Herbarium has determined during the year many thousands of specimens, in order that they might receive their proper place in the study series. The determinations of many

sheets already in the collections have been corrected from time to time, as special groups were studied or mistakes in names were discovered. The *Amaranthaceae*, *Chenopodiaceae*, and *Opiliaceae* have been revised during the year, also some genera of the *Moraceae*, and many isolated groups of less importance. An attempt has been made to reduce the accumulation of undetermined material in some of the larger South American genera, such as *Solanum*, a task that is greatly simplified by use of the type photographs obtained through the work conducted with the aid of the Rockefeller Foundation Fund.

More than 20,000 mounted specimens were added to the Herbarium during the year. The majority of them were tropical American and especially South American plants, and of the latter several thousand were species heretofore absent from the collections. At present, especially for the groups in which type photographs have been inserted, the Herbarium of Field Museum possesses facilities for the study of South American plants such as exist in no other American institution.

Particularly striking have been the additions to the *Euphorbiaceae* or spurge family, in specimens of which the Herbarium is very rich because of special interest taken in this group by the late Dr. Charles F. Millspaugh, former Curator of Botany. There probably can be found nowhere else so complete a representation of the vast genus *Euphorbia*, and there are hundreds of species, also, of *Croton*, which in America is an even larger group. In the genus *Hevea*, comprising the trees that yield Pará rubber, and therefore one of the world's most important genera economically, the Museum now has represented nineteen species, illustrated by fifty-eight specimens from South America and elsewhere. The wealth of available material could be exemplified by other cases based upon even more impressive statistics.

Although, as recorded in the Report for 1930, the Museum's collection of the tropical family *Rubiaceae*, which contains such plants as coffee, cinchona or quinine, and ipecac, at that time was extraordinarily rich, it has been greatly enlarged during the past year. There have been added photographs of the many types in the Munich and Geneva herbaria, particularly those of the classic DeCandolle Herbarium of Geneva. Almost all the American species of the family are now represented by authentic material. Photographs have been added of the type specimens sent for study by European herbaria and described by Associate Curator Paul C.

Standley, while the number of original type specimens has advanced as a result of recent accessions of newly collected material.

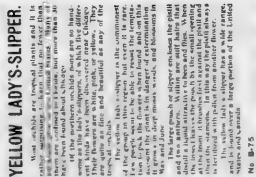
GEOLOGY.—Installation activities in the Department of Geology have been devoted chiefly to changing the color of the case interiors and labels to the standard buff recently adopted. This has involved the complete removal of the contents of the cases, their reinstallation, and the printing and installation of entirely new labels. The opportunity has been taken at the same time to make such changes as seemed desirable in the contents of the cases, and to substitute for less important specimens others of more interest and value. While the general plan of installation has remained much the same and most of the material shown is that formerly exhibited, additions and alterations have been made which materially improve the appearance and value of the exhibits.

In Ernest R. Graham Hall (Hall 38) all the upright cases, forty-one in number, were also altered in design, thus necessitating many changes in the shelving and the character of installation. In addition to cases reinstalled, three cases with entirely new contents were added to the Frederick J. V. Skiff Hall (Hall 37) series, and five new cases to Graham Hall, making a total for the Department of eight new cases.

The cases reinstalled included three in Stanley Field Hall, five in Hall 34, one in Clarence Buckingham Hall (Hall 35), one in Hall 36, forty-seven in Skiff Hall, and forty-one in Graham Hall. These make a total of 106 cases either reinstalled or newly installed during the year.

In Stanley Field Hall the three cases reinstalled were those illustrating varieties of quartz, comparison of ancient and modern animals and plants, and the evolution of the horse. To the case of varieties of quartz there were added a number of specimens of Brazilian rock crystal collected by the Curator on the Marshall Field Brazilian Expedition of 1922. To the case showing comparison of ancient and modern animals and plants, four specimens were added and the liquids of such specimens as were contained in fluids were renewed. To the case illustrating evolution of the horse, the superb model of the race horse "Man o' War," presented by Mr. Frederick Blaschke, of Cold Spring-on-Hudson, New York, was added and some other alterations were made. Previous to installation the cases were relined with buff-colored fabric.

In H. N. Higinbotham Hall (Hall 31) the beautiful ruby topaz and black opal gems presented by the late Mr. Richard T. Crane, Jr.,



TYPE OF CASE LOANED TO THE SCHOOLS OF CHICAGO BY THE N. W. HARRIS PUBLIC SCHOOL
EXTENSION OF FIELD MUSEUM OF NATURAL HISTORY
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were installed in the groups to which they belong, and the five gem cases in the hall were opened and cleaned.

In Hall 34 three cases of meteorites and two of minerals were reinstalled. To the case of Brenham meteorites, several specimens of the oxidized meteorites of this fall, found in 1928, were added. The case containing the Long Island meteorite was provided with a new label so placed as to make reading easy, and specimens of the slickensided and polished interior of the meteorite were put in prominent positions. Labeling of the exhibit of meteorites was completed, a total of 1,215 labels being installed.

In the collection of systematic minerals, an exhibit of gases of the atmosphere, transmitting an electric current so as to show the spectrum of each, was added to the case of elements, and the entire case was reinstalled. Specimens of other ingredients of the atmosphere, such as water and carbonic acid gas, were added to the case of oxides. The series of radioactive minerals, numbering seventeen specimens and an equal number of roentgenograms, was completely reorganized. New roentgenograms were made by the Museum's roentgenologist for each specimen, and the series was reinstalled. A number of additions were made to the minerals shown in other cases, especially to the quartz series and some of the sulphides. The cases containing the William J. Chalmers crystal collection were cleaned, some specimens added, and the labeling of the collection completed.

In Clarence Buckingham Hall (Hall 35) a case of volcanic products was reinstalled in order to introduce large specimens of malpais collected near Grant, New Mexico, by the Marshall Field Expedition to that region in 1929. In Hall 36 a case devoted to sulphur and magnesia products was reinstalled in order to include the sulphur exhibits from Freeport (Texas) localities which had been received during the year. Some minor additions were also made to the contents of this case. In this hall, also, the large painting of the Minnesota Iron Mine at Soudan, Minnesota, which had been exhibited in the Jackson Park building but not previously in the present building, was hung adjoining the Chandler Iron Mine model.

In Frederick J. V. Skiff Hall (Hall 37) three cases were newly installed. Two of these were devoted to the ores of Japan which had been received from the Sesquicentennial Exposition, Philadelphia, but had not been displayed. This exhibit shows the most important gold, silver and copper ores of Japan. Another newly installed case was devoted to ornamental minerals, chiefly of copper compounds. Reinstallation of forty-seven additional cases in this hall was com-

pleted. Beginning where work had been discontinued the previous year, the cases were reinstalled in a similar order. The first series reinstalled was that of nine cases of marbles. These were grouped into English and Irish marbles, English and Norwegian marbles, Alabama, Virginia and Tennessee marbles, Vermont and Georgia marbles, Winooski marbles, Greek marbles, Japanese marbles and two cases of serpentine marbles. Complete descriptive labels were prepared and installed in all these cases. A single case was also devoted to Mexican onyx. Connected with this series, the building stones were reinstalled in flat cases, divided into groups of granite, marble, sandstone and limestone.

Representing the non-metallic minerals of economic importance, two cases were devoted to asbestos and its products and one case to abrasives, thus giving a much better grouping of this series than existed before. Other cases devoted to non-metallic, economic minerals were one each to the phosphate of lime, apatite, and the ore of lithium which occurs as rubellite, from San Diego County, California. The case devoted to models showing the development of the blast furnace was reinstalled with new and complete labels, and a series of typical iron ores was added. In the contents of two cases of iron ores and iron and manganese ores a number of changes of specimens were made in order to give a representative series of the ores principally in use at the present time.

A single case was devoted to ores of mercury, chromium and tungsten, the series of ores of the two latter metals being enlarged because of the increased industrial importance which these metals are assuming at present. One case of what are known as porphyry copper ores and two cases of the Michigan copper ores were reinstalled. One of these was largely devoted to the collection of crystallized copper presented several years ago by Messrs. N. F. and A. F. Leopold of Chicago. Of ores of zinc, one case of those from Greece and another of large specimens from Joplin, Missouri, were reinstalled.

In the series of gold, silver and lead ores, eight cases, containing ores of South America, Mexico, New Mexico, Colorado, Alaska, and various other localities, were reinstalled. A single case was devoted to the nickel ores of New Caledonia, and a single case has also been devoted to ores of platinum, chiefly those of the Russian deposits.

Certain new features which have been introduced into the installation deserve mention. In the series of iron ores, an exhibit showing the composition of the four principal ores was prepared and installed.

One pound of each ore, with a mass of iron beside it of a size representing its iron content, is included in this series. A tray of the powder of each ore is also shown, as the color of the powder is a distinguishing characteristic. Since limonite is a hydrous ore, a bottle containing the quantity of water in this ore is shown in addition to the cylinder representing the amount of iron.

In connection with two large specimens of gold ore, there was prepared an exhibit to indicate the quantity of gold present in each. Thus, for a large mass of gold ore weighing 634 pounds and estimated to carry a value of \$25 per ton of gold, a cube of metal representing the quantity of gold in the ore was prepared and placed beside it. The cube of metal in this instance is only about one-fourth of an inch in diameter. Beside another mass of gold ore of lower grade, weighing 240 pounds and carrying a value of only \$10 per ton, there is shown a similar cube representing the quantity of gold it contains. Owing to the low grade of the ore, this cube is less than three-sixteenths of an inch in diameter. There have also been introduced into the cases in appropriate places, specimens of a number of elements in the metallic state, which are either, like thallium, rare, or, like calcium, seldom seen. For this addition the Museum is chiefly indebted to Mr. Herbert C. Walther, of Chicago, who presented these specimens. They include, besides specimens of metallic thallium and calcium, palladium, tellurium, molybdenum, titanium, tungsten and cobalt.

In order to show the geographic distribution of ores, seventeen maps were supplied. Seventy-four descriptive labels, setting forth the principal facts regarding the ores and metals exhibited and their uses, were prepared and installed in the various cases. The majority of the large labels were installed in the bays of the cases so that they could be easily read.

In Ernest R. Graham Hall (Hall 38), as has been mentioned, forty-one cases were reconstructed. The reconstruction consisted of paneling the upper portion of each case and reducing the size of the glass front by an equal amount. In the paneled portion were installed the electric lights which had previously been placed in boxes above the cases. By this change, the lighting elements were brought nearer to the contents of the case, thus providing greater illumination of its interior, and the boxes above the cases which had interfered somewhat with the view of the mural paintings in the hall were eliminated.

As fast as the cases were reconstructed they were reinstalled, such changes being made in the exhibits as proved necessary or desirable.

The reinstalled cases are devoted to the following subjects: "Tar beds" Pleistocene mammals, North American fossil bison, European and African Pleistocene birds and mammals, North American Pleistocene mammals, Illinois mastodons, South American ground sloths, North American Miocene mammals (two cases), South American Miocene mammals, Miocene "corkscrews," Oligocene mammals, Oligocene titanotheres (two cases), Middle Eocene mammals, South American Eocene and Oligocene mammals, Eocene fishes, Eocene shells and plants, Cretaceous reptiles, Cretaceous dinosaurs, Cretaceous fishes, Cretaceous invertebrates, Cretaceous plants and mollusks, Jurassic dinosaurs (three cases), European Jurassic reptiles (two cases), European Jurassic fishes, Permian reptiles and plants, Jurassic invertebrates (two cases), Jurassic cephalopods, Carboniferous fossils, Devonian fishes, Devonian corals, Paleozoic sponges, Silurian fossils (two cases), Ordovician fossils, Cambrian fossils and comparative fossils.

In addition to the cases reinstalled, three new groups were added to the hall during the year. The three groups are of large size, two occupying central positions at the ends of the hall. The group installed at the north end of the hall is a life size restoration of titanotheres (see Plate X), extinct animals which resembled rhinoceroses in appearance but were as tall and bulky as elephants. The group is composed of three animals—an enormous male which is in standing position, and a female and young animal lying down. The background and accessories reproduce a supposed habitat of these huge beasts. The large male figure is thirteen feet eight inches in length and eight feet seven inches high. This is the first time an attempt has been made to reproduce with scientific accuracy in full size and three-dimensional form in natural surroundings, a group of these great beasts. The male figure was constructed from measurements and studies of the fossil skeleton at Peabody Museum, Yale University; the female figure from a skeleton at the American Museum of Natural History, New York; and the young one from a skeleton at the University of Wyoming. These titanotheres were great, two-horned, hooped mammals which lived about 30,000,000 years ago in what are now the so-called "Bad Lands" of Nebraska and the Dakotas. They were a unique class of animals which became extinct at a very remote period. The eminent sculptor, Mr.

Frederick Blaschke, designed and constructed the restorations as he did also the adjoining groups of the Neanderthal family and the *Mesohippus*. The titanotheres group, as well as these others, are results of the contribution made by Mr. Ernest R. Graham.

At the south end of the hall another group illustrates a scene in a swamp forest of the Coal age (see Plates IV, V, IX and XIII). Much research and three years of exacting labor were devoted in the Stanley Field Plant Reproduction Laboratories of the Museum to the preparation of this magnificent work. It represents the most serious effort ever made to reconstruct in three-dimensional form a whole assembly of plants of the Carboniferous age.

The group illustrates a scene in a dense swamp forest, at the margin of a stretch of stagnant water. Plants of the period, which is estimated to have been 250,000,000 years ago, were of low orders, far removed in structure and constitution from the forest-producing flora of the present day. The forms in the group which attained the size of trees, belonged to orders such as are known today as club-mosses and "horsetails" or "scouring rushes." There are also represented some tree-ferns resembling those of the present day and plants of other groups which have become extinct.

As a source for the restorations, remains preserved in fossil form were used for making casts giving the characters of the leaf scars and other exterior features of the trees, as well as of the details of the foliage. The giant "horsetails" or calamites of the period are represented by a number of trunks carrying characteristic foliage. Trunks of various sizes and species also illustrate the great club-mosses which formed the bulk of vegetation of that period. One of these, several feet in diameter, is shown, and several have a height of fifteen feet. There are also shown several species belonging to the important group of seed-ferns, now extinct, and of the early gymnosperms, called Cordaites, which later gave rise to certain of the conifers.

Fossils found at Mazon Creek, Illinois, were used as the chief source from which casts and impressions were obtained for the reproductions, and on the whole the scene represents such a forest as probably existed in that locality during the coal-forming period. Besides the plant life, animal life characteristic of the period is represented by typical specimens. Of these the most prominent is a primitive dragonfly having a wing spread of more than two feet. Cockroaches, which were abundant during the period, are also represented. The earliest four-legged animals had begun to appear

in this period in the form of amphibians, and these are represented by several restorations, the largest being that of the amphibian known as *Diplovertebron punctatus*. Illuminated labels and large numbered charts indicating the name and position of each object in the group are installed adjoining the case.

Great credit is due to Dr. B. E. Dahlgren, Acting Curator of Botany, for his work in designing the group, for the research he carried out to insure accuracy of details, and for the constant supervision he exercised over execution of the plans. Messrs. John Millar, Emil Sella, George Peterson, Isidor Ileakis, Milton Copulos and John Wolcott of the botanical staff also devoted themselves most earnestly and unremittingly to the work. Professor A. C. Noé, paleobotanist of the University of Chicago, gave constant advice and cooperation, while Mr. Samuel Chambers of the Redpath Museum of McGill University, Montreal, and Dr. R. C. Bassler of the United States National Museum, assisted by furnishing fossils which were used to obtain data for the reproductions. Professor W. K. Gregory of Columbia University and Professor A. S. Romer of the University of Chicago, also gave valuable advice and assistance, especially in the restorations of the amphibians.

The third group added to the hall during the year shows skeletons of two South American ground sloths of Pleistocene age mounted in life-like positions (see Plate XVIII). These sloths, belonging to the genus *Scelidodon*, were collected by the Marshall Field Paleontological Expedition to Bolivia in 1927. They were excavated from accumulated valley clays and sands. The skeletons are mounted in positions such as the animals would have assumed either in feeding upon the leaves of trees or in digging for roots and tubers. The skeletons have the massiveness characteristic of these animals and show admirably the peculiar features of their anatomy. One skeleton, eight feet in height, is in an erect position, and the other, nine feet eight inches in length, is in a burrowing position. The breadth of the body is also remarkable, the larger skeleton being four feet in width. The preparation, articulation and mounting of the bones, as well as the construction of the model of the tree, were the work of Preparator P. C. Orr, under the direction of the Associate Curator of Paleontology, Elmer S. Riggs.

Adjoining this group is a case devoted largely to specimens representing other members of the varied family of ground sloths which form so conspicuous a part of the extinct life of South America. The genera represented from the Pleistocene formation in this exhibit

include skulls of two species each of *Megatherium* and *Myiodon* and one species each of *Glossotherium*, *Scelidotherium* and *Scelidodon*. Besides skulls of the above, part of the bony covering of one species is shown. The sloths of Pliocene age will be represented by a skeleton of *Pronothrotherium* which is now being mounted.

In addition to the new groups, there was installed a complete skeleton of *Trigonias*, the most ancient and primitive North American representative of the true rhinoceroses. Besides peculiarities of the teeth, this animal is of interest in having had four toes on the front foot instead of three, as in the modern rhinoceros. The skeleton is mounted against a matrix background occupying one-half of an upright case, the other half of which is devoted to a partial skeleton of the aquatic rhinoceros *Metamynodon*.

To the case of European Pleistocene mammals there were added the large skull and jaws of the woolly rhinoceros received during the year.

The final five mural paintings in the series of twenty-eight presented by Mr. Ernest R. Graham, which have been in preparation during the past five years, were received from the artist, Mr. Charles R. Knight, of New York. The titles of these paintings are: Crested, Duck-billed and Armored Dinosaurs; Great Hoofed Mammals (Titanotheres); Flying Reptiles and Primitive Birds; Great Horned Mammal and Four-toed Horse (see Plate XIV); and African Reptiles of the Permian Period. The two first mentioned are twenty-five by nine feet and the others are ten by nine feet. These were hung in the locations reserved for them, and together with the twenty-three previously received they provide on the walls of this hall a remarkably vivid representation of the scenery, plants and animals of past geologic periods. In connection with the installation, all of the paintings were cleaned and a protective coating was applied to their surfaces. Framed labels were provided for the entire series.

In the paleontological laboratory, forty-two specimens of South American fossil mammals were prepared for study and determination. Skeletons of the Pliocene glyptodon, *Sclerocephalus*, and the rare Pliocene ground sloth, *Pronothrotherium*, were prepared, and they are now in process of being mounted as a group with background and accessories. Owing to the extreme rarity of parts of the skeleton of the *Pronothrotherium*, five series of casts of its skull and many other bones were made before it was mounted, in order to provide for further study and for distribution to other institutions which might desire replicas of the specimen. A skull of the South

American fossil mammal, *Trachytypotherium*, and of the woolly rhinoceros, *Coelodonta*, from the Pleistocene of Europe, were also prepared for installation. Of North American fossil mammals, a skeleton of the Lower Oligocene rhinoceros, *Trigonias*, and skulls of the rare Eocene mammals, *Protitanotherium* and *Eobasileus*, were likewise prepared. A series of casts of the jaw of a rare Lower Eocene uinthere was made to be used for distribution. For the study collection, fifty-five skulls or skeletons of recent animals were prepared.

A marked advance in the completeness and accessibility of the study collection was made by rearrangement of the entire collection of North American fossil mammals. This was carefully grouped in stratigraphical order and labeled. The collection occupies 370 trays of the standard size, eighteen by twenty-seven inches. Twenty-nine boxes of fossil reptiles and mammals which had not been opened since their transfer from the Jackson Park building were unpacked and distributed to the proper groups. The collections of fossil mammals now occupy Rooms 101 and 107, and those of the dinosaurs from the Morristown and Lance Beds were transferred to the ground floor store room. In Room 107 a large closet was fitted with shelves and is devoted to the storing of the field-collecting equipment.

The stacks containing trays devoted to the study collections of ores, minerals and invertebrate fossils in Room 120 were rearranged and moved so as to make about one-fourth of the floor space of the room available for use by the general Library. Fourteen steel cabinets were provided, and the rearranged collections were transferred to them. About 200 specimens, most of which were of large size, were discarded. At the same time the walls and ceiling of the room were painted and the woodwork renovated. Walls and ceilings of Rooms 118, 122, 123 and 124 were also cleaned and the woodwork polished.

Analyses and investigations of various substances, both for scientific and technical purposes, were carried on in the chemical laboratory. Seven analyses of limestones and shales from the Arctic regions were made by Associate Curator Henry W. Nichols, as a contribution to a publication on the Arctic fauna by Assistant Curator Sharat K. Roy. Besides their technical value, these analyses were useful in affording comparisons of the rock matrices in which the fossils from the different localities occurred. Determinations of the quantity and nature of the organic matter of some fossil worms

were also made in the laboratory by Mr. Nichols for use in another paper by Mr. Roy.

A complete quantitative analysis of the Breece iron meteorite received during the year was made. An unusual mineral phosphate found in a Missouri cave was given a preliminary analysis with results indicating a possible new mineral. Numerous minor identifications of minerals were made by the Curator and Associate Curator. An incrustation on an archaeological specimen was analyzed for the Department of Anthropology. A liquid for exterminating moths, and a paper to be used for photogravures, were tested to determine their fitness for these uses. Restoration of ancient bronzes by the Fink electrolytic process as modified by Mr. Nichols was carried on. Two Assyrian bronzes were restored for the Oriental Institute of the University of Chicago, and four bronzes from Kish, belonging to Field Museum, were renovated. The large bronze Egyptian cat from Hall J, which prior to 1931 had been restored by the Fink process, was found to be undergoing additional corrosion and it was given some further treatment to prevent continuance of the damage. It was found that in the original treatment an insufficient amount of time had been allowed for the removal of the soluble salts, and this defect was remedied.

Considerable experimenting was carried on with a view to perfecting the exhibit of atmospheric gases (see p. 134). When first installed, this exhibit failed to give satisfactory results. By providing an eliminator for reducing the lighting current and by adjusting the wiring in the set of tubes, the operation of the exhibit was much improved.

The rock-cutting and grinding machine was given a needed overhauling, and is now in good running order. Mr. Henry Essig of Chicago, a skilled lapidary, kindly gave advice gained from his long experience as to desirable changes to be made in the reconstruction of the machine. A new counter shaft with babbitted bearings was connected both with the saw and the lap, and in place of the diamond saws previously used, which are expensive and difficult to secure, metal disks to which carborundum powder is automatically fed were substituted. A specially designed hood for holding and supplying abrasives was also provided, and this avoids the spattering and waste which was one of the worst faults of the machine formerly. Sawing can now be automatically performed and narrower cuts are made. This equipment has been especially useful for the study of the internal structure of invertebrate fossils, especially that of bryo-

zoans, corals, gastropods and cephalopods, upon which generic and specific differentiations are now largely based. Sixty-eight thin and seven polished sections were made for this purpose during the year by Assistant Curator Roy, and these were of much service in the identification and description of Baffin Land fossils.

ZOOLOGY.—Much progress was made in the preparation and installation of large mammal groups. Actual installation was confined to the Hall of American Mammal Habitat Groups (Hall 16) where four groups were completed and opened to the public. Three of these represent South American subjects—the guanaco, the tapir, and the great anteater. The fourth—the mountain lion or cougar—is both North and South American. There now remains only one more subject, the caribou, to complete all the groups planned for this hall.

The guanaco group contains five specimens, adults and young, of the so-called "South American camel." They occupy a setting representing the pampas of southern Patagonia which are shown stretching away behind the animals, and which are reminiscent of the sage-brush plains of some parts of the western United States. A large male guanaco stands alert, while two females accompanied by the young are seen about to move off. Under their feet are the dry grasses on which they feed and the small scrubby brush of the region.

The group of American tapir (see Plate VI) shows three of these shy animals, two adults and one partly grown young. They are represented in mid-day under the shade of a tree at the edge of a grassy swamp. Beyond them extends a painted scene typical of southwestern Brazil—open marsh and scattered clumps of small trees with here and there a slender palm. In the tree above them, partly concealed by foliage, is a large, handsome, blue macaw.

The great anteater, which is the subject of the third South American group completed during the year, is one of the most peculiar of the many queer animals inhabiting the American tropics. Its very long, slender head, small mouth, great claws, and enormous bushy tail combine to give it a grotesque appearance. In the group three animals are shown, two adults and one partly grown young, engaged in tearing open a termites' nest. The setting is an opening in the light forest or semi-savanna which these animals prefer.

The specimens for all three of the South American groups were obtained by Assistant Curator Colin C. Sanborn while he was a

member of the Marshall Field South American Expedition of 1926. The taxidermy in all three cases is by Mr. Julius Friesser of the Department of Zoology, and the backgrounds were painted by Mr. Charles A. Corwin, Staff Artist.

The group of mountain lion or cougar shows an old female fondling her two small spotted kittens in front of her den in a secluded mountain retreat. The male animal, as is natural during the period of rearing the young, does not appear. The subject is skilfully handled to bring out the idea of the peaceful home life of a wild beast sequestered from all disturbance. Bits of deer skin and fragments of bone are strewn about the mouth of the den, which is shaded by an overhanging piñon tree. A deep canyon lies below and the farther side of it rises in sheer cliffs of bright-colored sandstone bathed in sunlight. The group was prepared by Staff Taxidermist Leon L. Pray, with painted background by Mr. Corwin. For indispensable assistance in procuring accessories and photographic data for this group, the Museum is indebted to Mr. J. D. Figgins, Director of the Colorado Museum of Natural History, Denver.

In Hall 15, where animals are exhibited in systematic order, an important improvement was made by the reinstallation of a case of monkeys with the addition of six interesting specimens obtained by recent expeditions. Most important are the golden or snub-nosed monkey, obtained by the William V. Kelley-Roosevelts Expedition to Eastern Asia for Field Museum; the Abyssinian guereza or colobus, obtained by the Field Museum-*Chicago Daily News* Abyssinian Expedition; the Himalayan langur, from the C. Suydam Cutting Sikkim Expedition; Kolb's white-throated guenon, from the Harold White-John Coats African Expedition; and the maroon langur, from the Cornelius Crane Pacific Expedition. The taxidermy for this very successful case was done by Mr. Arthur G. Rueckert of the staff.

Other additions in Hall 15 include a British wildcat and two South American monkeys.

A number of hoofed mammals in George M. Pullman Hall (Hall 13) were removed from mahogany bases and reinstalled without such bases in new cases. This resulted in greatly improved appearance not only of individual specimens but also of the whole hall.

The habitat groups of birds in Hall 20, eighteen in number, were completely rearranged. All the groups were removed from the center of the hall and placed at the sides in pairs, thus preserving

the view from two sides and creating a pleasing arrangement. A wide central aisle is now provided from which visitors may view the groups to best advantage. During the process of making the changes all the groups were thoroughly cleaned and renovated, giving them the appearance of newly prepared groups. Improved lighting was installed, and new labels and distribution maps were provided.

In Hall 21 the serial exhibit of North American birds received the important addition of a screen showing the principal species of geese and swans (see Plate XI). A number of these were obtained in California during a field trip made by Staff Taxidermist Ashley Hine, and they were prepared immediately after his return. Thirty-three additional birds were mounted for systematic exhibits and much work of a preparatory nature was done.

An important addition to the reptile exhibits in Albert W. Harris Hall (Hall 18) is a reproduction of the reticulated python, largest of living snakes (see Plate XV). This was prepared by Staff Taxidermist Leon L. Walters and Mr. E. G. Laybourne from a specimen collected in Sumatra by the Philip M. Chancellor Expedition of 1929. It is twenty-six feet long, and is shown in coiled position surrounding its eighty-three eggs which were collected with it.

Models in cellulose-acetate were produced of six salamanders, ten lizards and eleven snakes for addition to the systematic exhibits in Harris Hall. A plaque exhibiting the hind limbs of a python, to illustrate the little-known fact that primitive snakes have vestiges of limbs, also was completed.

A large number of fishes were prepared or partly prepared for exhibition, including all those intended for use in the Bahama under-sea group. Actual installation of fishes, however, was confined to certain species of special interest which were added as substitutes or additions to cases already occupied. Among these are six reproductions in cellulose-acetate, representing a poison fish, scorpion fish (see Plate XIX), winter flounder, pelican flounder, frostfish, and wolf herring.

Reorganization of the osteological exhibits in Hall 19 was begun with the transfer of various skeletons to new cases released from George M. Pullman Hall (Hall 13). As a trial installation to determine matters of arrangement, labeling, backgrounds, and educational possibilities, a case of skeletons of carnivorous mammals was prepared, containing one example of each family. Individual and case

labels were introduced, calling attention to the structural peculiarities illustrated by the specimens.

The condition of the reference collections of mammals and birds was greatly improved by the addition of twenty-six steel storage cases. Sixteen of these were assigned to birds, four to mammal skins, and six to mammals in alcohol. It is still necessary to use old-style cases for a considerable proportion of the bird collection, but enough new cases are now available to serve as a foundation for a permanent, well-ordered arrangement.

Much progress was made in rearranging the mammal collection and especially in dressing skins and "making up" raw skins of medium and large size. With the exception of the large skins recently received from the Vernay-Lang Kalahari Expedition, the number of unprepared mammal skins is now comparatively small.

Largely through the services of Mr. Daniel Clark, volunteer student assistant, the condition of the collection of reptiles and amphibians was much improved. Tanks and glass jars were thoroughly cleaned, fresh alcohol was supplied wherever necessary, and the entire collection was overhauled. Turtles and crocodilians were transferred to two steel cases on the fourth floor in space intended later for expansion of storage for large mammal skulls and bones. Some relief was thus afforded to the congestion in Room 88 caused by the recent rapid growth of the collections.

Pending the provision of space and cases for the exhibition of insects, this division was largely occupied in the much-needed collation and rearrangement of the reference collection. This is work which proceeds slowly since it requires the determining of many species, the assembling of material of like kind from different sources, and the repinning and relabeling of many specimens. The new drawers and steel cabinets obtained in 1930 were utilized, eleven drawers of North American roaches, mantids, walking-sticks, and grasshoppers were arranged in systematic order, and twelve drawers of beetles were rearranged.

Detailed plans were prepared for use in connection with various groups of Indian mammals for William V. Kelley Hall (Hall 17). Through the cordial cooperation of Sir Reginald Spence of the Bombay Natural History Society, arrangements were made to secure accessories and field sketches for these groups. Under this cooperative plan, members of the staff of the Bombay Society's museum will make a special field trip for this purpose early in 1932.

THE N. W. HARRIS PUBLIC SCHOOL EXTENSION

Twenty years have now passed since December, 1911, when the late Norman Wait Harris gave Field Museum a generous fund to endow the institution's extension work for the schools of Chicago. The N. W. Harris Public School Extension of Field Museum has grown steadily during this period. Today its activities reach every part of Chicago, and it is serving the youth of the city as Mr. Harris hoped that it would.

Mr. Harris's gift enabled Field Museum to pioneer in what was a new field. A careful survey of the work to be done and comprehensive plans for the best possible methods of accomplishing it were necessary. The steady growth of this Department and the fact that many institutions in other communities have followed its lead attest to the wisdom incorporated in those first plans.

By the end of 1913 seven schools had received Harris Extension cases. At the close of 1931 this Department is regularly serving 445 schools and children's institutions with forty cases each a year. There are more than a half million pupils in daily attendance at the 390 public schools receiving these exhibits. Many thousands more attend the fifty-five private and religious schools, branch libraries, social settlements and boys' clubs which Harris Extension also serves. Fifteen new schools were added to the regular routes in 1931. The Department's two motor trucks traveled more than 12,000 miles making deliveries during the year.

A map showing the location of each institution receiving Harris Extension cases has been made. This shows graphically that no part of Chicago is being neglected, and that Harris Extension service literally covers the city. As in former years, a large number of requests for this service have been received from suburban towns. It is regretted that these requests cannot be granted. The regular service of the Harris Extension has always been confined to the city of Chicago.

With the growth of the work of this Department and the increased use of the exhibits by the schools some wear and breakage of cases have been inevitable. In recent years the necessity of repairing and reconditioning cases has made ever-growing demands on the time of the preparators and cabinet-maker. During 1931 twelve cases were completely reinstalled and 446 repaired. In the construction of new exhibits, which is going on constantly, every possible effort is being made to produce cases that will be lasting. The fifty-three new cases completed in 1931 have been made as light and durable

as possible to reduce wear and accidental breakage. With a thousand cases in almost constant use this is of the greatest importance.

In addition to the regular route service maintained throughout the school year cases have been sent in response to special requests. Eighteen requests from the public schools for cases in addition to those regularly supplied were granted this year. Exhibitions of from two to twenty cases each were sent to Marshall Field and Company's Book Section, the booth of the Wild Flower Preservation Society at the Flower Show in the Merchandise Mart, the Y.M.C.A. Hotel, Camp Algonquin, Wieboldt Stores, and the University High School. A large booth was maintained at the International Live Stock Exposition in the Union Stock Yards. As in previous years, institutions have requested the loan of Harris Extension cases either to study their construction for adaptation in their own extension work, or to stimulate interest in the foundation of such extension departments. In the past year two cases were sent to the Cranbrook Institute of Science, Bloomfield Hills, Michigan, and six cases to the St. Paul Institute, St. Paul, Minnesota. As a result of the interest shown in three Harris Extension cases borrowed for its book fair, the University High School of the University of Chicago requested that it receive regular scheduled loans of cases as the public schools do. This request was granted.

With the opening of schools in September a new motor delivery truck went into service for the Department. This truck was especially constructed to carry Harris Extension cases safely and efficiently, and it has proved most satisfactory. It is a gift from Mr. Albert W. Harris.

ART RESEARCH CLASSES

The value of the art research classes conducted at Field Museum under a cooperative arrangement with the Art Institute of Chicago is emphasized by the fact that the curriculum of the School of the Art Institute has been revised so as to require all students in its teachers' training classes to spend at least one year in research at Field Museum.

The art research classes receive instruction from Mr. John Gilbert Wilkins, a member of the Art Institute faculty especially assigned to conduct the work at Field Museum. These classes were established eight years ago, and have shown consistent progress in the artistic merit of their students' work throughout that period. Painting, illustration, decorative design, sculpture and other branches of art are studied in the courses offered.

The courses provided include the regular ones planned to fit the needs of students specializing in illustration and design, and the teachers' training course. Both classes are enabled to make nature studies from a wealth of specimens which would be available to them nowhere else in Chicago, and under especially favorable conditions. Slow motion pictures are used by the classes as a supplementary aid in studying the structure and action of animal life.

The second and revised edition of the book *Research Design in Nature*, compiled by Instructor Wilkins, was published in 1931. It is in two volumes, and contains several hundred plates (including color plates) of work done by Mr. Wilkins' students, based wholly on subjects studied among the exhibits of Field Museum. The book is widely used for educational and reference purposes.

The Museum has assigned a new class room to the art students. It is decorated in two tones of soft gray-green, which make it attractive and at the same time provide an excellent light in which to work. New tables and desks, and a large cloak room and lockers provided this year, increase the conveniences available to students.

DIVISION OF PUBLIC RELATIONS

In the work of the Division of Public Relations during 1931 the principal emphasis, as usual, was placed upon distribution of information through the daily press. On the average, nearly six articles a week were prepared at the Museum and published in the newspapers. While publicity efforts were concentrated chiefly upon newspapers of Chicago and vicinity, the Museum's activities have received attention also in the press of the entire nation, and in many other countries, through the cooperation extended by national and international news agencies.

Especially gratifying has been the response made by the Chicago newspapers not only in publishing the news sent out by the Museum, but in following this up by sending reporters, photographers and artists to the institution to obtain material for special articles and series of pictures, the extent of which this year exceeded similar publicity in the past. Those newspapers which have always given generous space in their columns to the Museum continued to do so, while others, which in the past have been inclined to give more sparingly of their space, this year displayed a much stronger interest in the Museum.

In addition to its work with the newspapers, the Division of Public Relations carried on the publication of *Field Museum News*,



CAFETERIA

View of part of new lunch room for visitors to the Museum

THE UNIVERSITY OF CHICAGO
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the monthly bulletin for members, and continued all its other regular activities, such as preparation of special articles for magazines and periodicals of various types; preparation of advertising copy for use in various media generously placed at the disposal of the Museum by a number of organizations; extension of publicity by cooperation with radio broadcasting stations and makers of motion picture newsreels; distribution of descriptive folders and other material to attract visitors; and editorial work on certain general publications and other printed matter of the Museum.

FIELD MUSEUM NEWS.—Every effort has been made to improve constantly the contents of *Field Museum News* so that its interest and service to Members of the Museum might increase. Because of the appeal of pictures to most readers, the number of illustrations published was increased as far as possible. The news columns of the bulletin have kept Members informed of all important activities of the Museum, and have announced well in advance all lectures, children's entertainments and other such events. Special articles by many members of the scientific staff have presented a large amount of information on a variety of subjects, much of it of a character not duplicated in other periodicals.

Distribution of *Field Museum News* has been made promptly to all Members of the Museum before the beginning of each month, and it has also been circulated as an exchange unit to a list of other scientific institutions, and to the press. Editors of many newspapers and magazines have reprinted or quoted in part articles from this bulletin, and it thus has served as an additional medium in the Museum's general publicity campaign.

NEWSPAPER PUBLICITY.—The Division of Public Relations released 297 news stories during 1930, or an average of close to six each week. In addition, 101 brief or "filler" items were distributed, thus bringing the total of notices obtained for the Museum by its own direct efforts to a total of 398.

Copies of this publicity matter were supplied to the seven principal daily newspapers and the City News Bureau of Chicago; to some sixty community and neighborhood papers published in the city; to more than fifty Chicago foreign language newspapers; to about sixty newspapers covering the principal suburbs, cities and towns within a 100-mile radius of Chicago; to all the principal national and international news agencies; and to the Springfield bureau of the Associated Press for its special service to newspapers

throughout the state of Illinois, which obtains publicity additional to that effected in the national distribution carried out through the Chicago office of the same organization.

Photographs were sent with many of the publicity stories, prints from 103 negatives having been released by the Museum. Copies of each of these photographs were furnished to thirty-one leading newspapers and news photograph agencies, through which hundreds of additional copies were made and distributed to newspapers all over the world. Photographs published in rotogravure sections of newspapers make an especially desirable form of publicity, and many papers with such sections made splendid use of these pictures.

As in other years, news emanating from the Museum frequently has inspired editorials in important newspapers all over America and occasionally abroad.

The majority of the Museum's releases were news stories of from one-half to two-thirds of the average newspaper column. Others ranged from a column to items of fifty words or less. Practically every story released was printed in several Chicago newspapers, and many in all of them; most of the releases also received extensive space throughout the country. Frequently, as has been the case in past years, newspaper staff writers have expanded these releases into half-page and full-page Sunday feature articles.

The cooperation of the newspapers is, naturally, the most important factor in the success of the Museum's publicity efforts, and for their generosity in this respect grateful recognition is herewith accorded to the American press in general, and especially to the *Chicago Tribune*, *Chicago Daily News*, *Chicago Evening Post*, *Chicago Evening American*, *Chicago Herald and Examiner*, *Chicago Daily Illustrated Times*, *Chicago Journal of Commerce*, and the national and international news agencies such as the Associated Press, United Press, International News Service, Universal Service, and Science Service.

It is difficult to make from the clippings received any accurate estimate of the amount of publicity obtained. Through the clipping bureaus it is not possible to obtain even a complete coverage of the English language newspapers, while certain groups, such as foreign language papers, are not covered at all by the bureaus. During 1931, as a measure of economy, Field Museum discontinued part of its clipping bureau service. The figures on clippings therefore represent only part of the actual number of notices concerning

the Museum which were published. The total number of clippings received for the year was 18,384, or an average of 1,532 each month.

Especially gratifying were the relations between the Museum and the *Chicago Tribune* during the year. In the Sunday edition of June 14 there appeared a special article on the educational value of the Museum, running for several columns, and accompanied by a picture in the rotogravure section. This article was written by Mr. James O'Donnell Bennett, noted feature writer, as the result of interviews with the President and Director of the Museum, and it has since been published by the *Tribune* in a pamphlet about Chicago institutions. Later in the year the *Tribune* sent several staff writers, photographers and artists to the Museum to accumulate a large collection of data and pictures for use in its new Sunday magazine section, *The Graphic Weekly*, at present published in out-of-town editions of the paper, and shortly to be published also in Chicago. Before the end of the year six full pages in colors presenting reproductions of all the twenty-eight paintings by Mr. Charles R. Knight in Ernest R. Graham Hall, and a similar page of pictures of objects selected from the Museum's Chinese jade collection, accompanied by extensive articles, had been published. Data and pictures had been collected by the *Tribune* for similar pages on the African elephants in Stanley Field Hall, the man-eating lions of Tsavo, most of the habitat groups of American mammals and birds, the Neanderthal family restoration, the meteorite collection, the Museum's industrial models, and various other subjects. The proposed publication of this matter, especially as this magazine section will soon be distributed in Chicago, promises to develop into the most prominently displayed, most widely read, and most continuous publicity the Museum has ever received.

Other especially important publicity during 1931 was an article of several columns on the Museum's contributions to the advancement of science, published in the *Chicago Evening Post* of November 13, and several pages and half pages published at various times in *The American Weekly*, Sunday supplement of the *Chicago Herald and Examiner* and associated newspapers all over the United States with a total of some twenty million circulation. Full pages in colors and rotogravure were devoted to the complete series of the Knight paintings in newspapers in various cities.

PUBLICITY IN PERIODICALS.—The Museum and its activities have again been the subject of numerous special articles which appeared in general and popular magazines, trade journals, scientific publica-

tions, and other periodicals. Of these, some were prepared at the Museum on the request of editors, and others were written by outside writers. They were usually based on data supplied by the staff, and illustrated with photographs furnished by the Museum. Among some of the publications in which this material has appeared are *Scientific American*, *Chicago Commerce*, *Science*, *Popular Mechanics*, *Popular Science*, *Americana Annual*, *International Year Book*, *Science News Letter*, *L'Illustration*, *Illustrated London News*, *Museums Journal* (London), *Chicago Visitor*, *Rocks and Minerals*, *Mid-week Pictorial of the New York Times*, *Collier's Encyclopedia*, *American Anthropologist*, textbooks published by Scott Foresman and Company, *Outdoor America*, *Museums of Peaceful Arts*, and *The Rotarian*.

ADVERTISING.—Space in various advertising media has been given to the Museum, free of charge, as in previous years. The Illinois Central Railroad and the Chicago and North Western Railway, which have been cooperating with the Museum for a number of years, again displayed at their city and suburban stations posters announcing Field Museum lecture courses. These posters were likewise displayed in Marshall Field and Company's retail store, in libraries, schools, and other institutions, and in many of the principal hotels and clubs of Chicago.

Full-page and half-page advertisements of the Museum appeared in the programs of the Chicago Civic Opera Company, which has extended this courtesy for a number of years. For several months similar advertisements appeared in all the theatre programs published under the title *The Playgoer*, issued by the Clyde W. Riley Advertising System.

Colored placards calling attention to striking exhibits at the Museum were again displayed in the Chicago street cars. These were printed and distributed at the expense of the Chicago Surface Lines, a company which has thus cooperated for years.

The Chicago Rapid Transit Company and associated interurban lines, including the Chicago, North Shore and Milwaukee Railroad, the Chicago, South Shore and South Bend Railroad, and the Chicago, Aurora and Elgin Railroad, distributed 50,000 Field Museum descriptive folders among their patrons. Space was again allotted throughout the year to Museum lectures and exhibits in the *This Week's Events Along the North Shore Line* posters which are displayed at all stations of the Chicago, North Shore and Milwaukee Railroad between Chicago and Milwaukee.

The Chicago Motor Coach Company continued extensive cooperation with the Museum. It distributed thousands of the Museum's descriptive folders, and in addition printed folders of its own, devoted to the Museum and other institutions in Grant Park, which it distributed in great quantities.

The Museum was widely advertised in connection with excursion trips from various cities conducted by practically all railroads entering Chicago. More than 115,000 Field Museum descriptive folders (in addition to the 50,000 distributed by the Rapid Transit and associated companies) were distributed by the Museum and cooperating agencies including practically every railroad and lake steamship line entering the city, and most of the principal hotels, clubs, travel bureaus, and department stores. The officers and delegates to many of the conventions held in Chicago were also furnished with supplies of folders.

Through the courtesy of the Chicago regional office of the Coca Cola Company the Museum was advertised on a large electrical sign of the type with moving letters, operated in a prominent position in the down-town part of the city.

Advertising was given to the Museum in the house organs for customers and employes published by many large Chicago corporations, and in the travel folders issued by railroads, steamship companies, tourist bureaus and hotels. The Museum cooperated to some extent with the International Live Stock Exposition in publicity and advertising.

RADIO.—More attention was given to extending the Museum's publicity by means of radio broadcasting than in previous years. The news releases sent to the press were also distributed to important local radio stations. Cooperation in broadcasting some of this material was received from WMAQ, the *Chicago Daily News* station; the *Chicago Evening Post* broadcasting over WLS, *The Prairie Farmer* station; WCFL, the Chicago Federation of Labor station; WGN, the *Chicago Tribune* station; and KYW, the Westinghouse-*Chicago Herald and Examiner* station. Also, through the courtesy of the National Biscuit Company and its advertising agency, Batten, Barton, Durstine and Osborn, frequent references to the Museum were made in their programs broadcast from WMAQ, while a special feature program devoted to the Museum was broadcast on July 23 from the same station through the courtesy of the Northern Trust Company and its advertising agency, the J. Walter Thompson Company.

NEWSREELS.—Museum activities of exceptional interest were covered in films taken by newsreel producers. Among these were the *Chicago Daily News*—Universal Newsreel, Kinograms—Universal Newsreel, and M-G-M International Newsreel.

EDITORIAL WORK.—Writing and editorial work on certain publications and other printed matter of the Museum, in addition to that on *Field Museum News*, occupied a large amount of time in the Division of Public Relations. Among the more important tasks of this kind was the new *Handbook of Field Museum* which was compiled and edited, and largely written by the Division; and the preparation of a new edition of the General Guide to the exhibits.

DIVISION OF PRINTING

The output of the Division of Printing during 1931, including publications, labels, post cards and miscellaneous job work, was extremely large and varied. The production of publications exceeded that of previous years, totaling 28,589 copies of the various books in the regular scientific series. These works required a total of 1,470 pages of type composition. Additional miscellaneous publications required 315 pages of composition, and a total of 16,000 copies of these was printed. Of major importance also was the printing of twelve issues of the four-page monthly bulletin, *Field Museum News*, with an average of nearly 7,000 copies a month.

Prompt service was given in printing exhibition labels required by the various Departments, the total number produced being 24,695. By concentrating on labels during the first part of the year, the Division of Printing enabled the Departments to bring to a highly satisfactory stage the work of relabeling exhibition cases which is being carried on throughout the building at the present time on a large scale.

A large part of the time of the Division of Printing was consumed by miscellaneous job work, in which the total number of impressions or pieces of printed matter produced was 808,875.

While it was necessary after September 30 to discontinue the services of six printers employed in the Division, the remaining employes continued the work in a most gratifying manner. There was naturally a decrease in production, but nevertheless production of labels, publications, and other printed matter continued on a satisfactory basis.

A summary of the publications of the year may be found under the heading DIVISION OF PUBLICATIONS, page 56. Following is a tabulation of other work done in the Division of Printing:

	Exhibition labels	Other impressions
Anthropology.....	12,588	8,633
Botany.....	4,624	15,000
Geology.....	6,512	.....
Zoology.....	669	17,757
Harris Extension.....	302	4,400
Raymond Foundation.....	.....	160,508
General.....	.....	121,104
Library.....	.....	700
Public Relations.....	.....	102,000
<i>Field Museum News</i>.....	.....	82,943
Direction Folders for Chicago Rapid Transit Company..	.....	125,000
Direction Folders for Division of Public Relations.....	.....	50,000
Division of Memberships.....	.....	60,830
Post cards.....	.....	60,000
Total.....	24,695	808,875

DIVISION OF ROENTGENOLOGY

Much important research work was carried on in the Division of Roentgenology during 1931. A new and unique x-ray technique which produces films of greater brilliancy than it is possible to obtain by the usual methods, and is peculiarly adapted to museum work, was developed by Miss Anna Reginalda Bolan, the roentgenologist. The ray used in this technique could not be used on living tissue because of its caustic effect, but it does not in any way harm the Museum materials submitted for examination.

Work on Egyptian and Peruvian mummies, which has been under way for several years, was continued. Photogravures of a large number of the roentgenograms produced in the Division, including many which reveal traces of the existence of common present-day diseases in ancient times, were published in the book, *Roentgenologic Studies of Egyptian and Peruvian Mummies*, by Professor Roy L. Moodie, which was issued from Field Museum Press during the year.

After a long series of experiments, the Division of Roentgenology succeeded in producing a new type of large roentgenogram which it is expected will mark the opening of a new chapter in x-ray work. The first roentgenogram of this type, with an Egyptian mummy as its subject, was completed on July 7. The dimensions of the film are seven feet by two feet. This is the first time that an entire adult mummy in its casket has ever been x-rayed on one film and with only one exposure. It is also, so far as is known, the largest

roentgenogram ever made of any subject. Heretofore mummies have been x-rayed in sections on the regulation size film, fourteen by seventeen inches. These smaller films were then pieced together and from this "mosaic" the specimen was viewed and its anatomical relation to cartonnage and casket estimated. There are obvious advantages in the new type in simplifying the process and insuring greater accuracy.

For the Department of Geology a series of exposures and prints for an exhibit illustrating the radioactivity of various minerals was made in the Division of Roentgenology.

DIVISIONS OF PHOTOGRAPHY AND ILLUSTRATION

PHOTOGRAPHY.—The total number of lantern slides, negatives, and prints made by the Division of Photography during 1931 was 29,367. The following tabulation gives a summary of the work performed:

	Lantern slides made	Nega- tives made	Prints made	Enlarge- ments made	Negatives developed for expedi- tions	Trans- parent labels made
Anthropology.....	24	1,195	2,717	4	84	..
Botany.....	80	571	17,010	149	36	2
Geology.....	...	337	639	10	60	3
Zoology.....	...	262	724	49	5	16
Harris Extension.....	...	87	136	28	22	..
Raymond Foundation....	208	14	33	...	...	..
Photogravure.....	...	648	469	...	...	..
Publicity.....	...	66	1,896	...	...	..
General.....	6	30	226	...	...	..
Gift.....	7	.....	452	4	...	..
Sales.....	76	.....	982	...	...	..
Total.....	401	3,210	25,284	244	207	21

PHOTOGRAVURE.—Following is a summary of the photogravures produced during 1931 by this Division:

	Number of prints
Publication illustrations.....	310,600
Guide illustrations.....	54,400
Memoirs Series illustrations.....	64,600
Guide covers.....	10,600
Membership headings.....	1,000
Poster headings.....	3,500
Post cards.....	60,000
Total.....	504,700

ARTIST.—Following is a summary of the work done during 1931 by this Division:

Pen and wash drawings.....	660
Lantern slides colored.....	308
Publication maps drawn and lettered.....	26
Case maps drawn and lettered.....	7
Chinese characters drawn.....	15
Pages of numerals drawn.....	7
Outline drawing of Carboniferous forest.....	1
Posters drawn.....	1
Photograph albums lettered.....	4
Negatives lettered for copyright.....	25
Floor plans lettered.....	3
Photographs retouched.....	59
Negatives blocked.....	60
X-ray negatives tinted.....	1
X-ray negatives blocked.....	2
Plant specimens colored.....	3
Cuts tooled.....	3
Miscellaneous items.....	25
Total.....	1,210

DIVISION OF MEMBERSHIPS

The membership of the Museum decreased somewhat in 1931 as compared to 1930. The following list shows the number of names on the membership rolls in each of the Museum's membership classifications at the end of 1931:

Benefactors.....	18
Honorary Members.....	20
Patrons.....	30
Corresponding Members.....	5
Contributors.....	101
Corporate Members.....	48
Life Members.....	345
Non-Resident Life Members.....	9
Associate Members.....	2,394
Non-Resident Associate Members.....	1
Sustaining Members.....	143
Annual Members.....	2,227
Total memberships.....	5,341

The names of all Members on the rolls as of December 31, 1931, will be found elsewhere in this Report.

CAFETERIA

During the past few years the cafeteria has become an increasingly important adjunct to the Museum, due to the ever increasing numbers of visitors, of whom so many are in the building at lunch time. In 1931, in order to serve better the comfort and convenience of the public, the cafeteria was completely remodeled, redecorated and equipped with the most modern facilities. This was done at great expense, and, as has been the case with so many of the improve-

ments made in the Museum, the burden of its cost and the work of planning for it were borne by President Stanley Field.

The remodeling has resulted in a completely new cafeteria of a type unique in institutions of this kind. While it is in the same location on the ground floor as the old one, everything in the large room is new, and even the ceiling has been reconstructed of a sound-proof material which produces a far quieter and pleasanter atmosphere for the patrons. During the reconstruction a smaller temporary room was fitted out and used so that there would be no interruption in service to the public.

An attractive scheme of decoration has been adopted in the cafeteria. On the walls have been painted in pleasing pastel colors large maps of all the continents, of the Arctic and Antarctic regions, and of the world as a whole. These suggest the worldwide scope of the expeditions and other activities of the Museum, and the vast sweep of lands and seas from which have been gathered its collections. The rest of the color scheme is in two shades of green with trim of harmonious woods and marble, and an attractive floor covering. Colorful new tables and chairs, new blue china, new silverware, and other table service, enhance the pleasant atmosphere created.

The most modern and complete equipment for cooking, electric refrigeration and dishwashing has been installed. The remodeling was completed and the new cafeteria opened to the public in June.

The number of persons served during 1931 was 94,456. This is a small decrease from the number served in 1930. The difference is probably due partly to the fact that during the period of remodeling the limited temporary facilities available could not accommodate all those who otherwise would have patronized the cafeteria, and partly to the economic depression which prevailed during the year.

As previously, the Museum makes available also accommodations for children and other persons bringing their own lunches. The room provided for this purpose, equipped with many tables and chairs, has also been improved. Those using these facilities have the privilege of supplementing their lunches with coffee, tea, milk, and other beverages and light foods sold at especially low prices at a service counter in this room. For extra-large assemblages of children a second auxiliary lunch room is provided.

A special lunch room has been provided for the scientific and administrative staffs of the Museum. This room has been equipped to permit of luncheon conferences to discuss Museum business when

required. Its walls are attractively decorated with enlarged reproductions of designs from a codex of the Aztecs, the original of which is in the possession of the Vatican. The room connects with the pantry of the main cafeteria and is served from there.

In the pages which follow are submitted the Museum's financial statements, lists of accessions, names of members, *et cetera*.

STEPHEN C. SIMMS, *Director*

ATTENDANCE STATISTICS AND DOOR RECEIPTS

FROM JANUARY 1, 1931 TO DECEMBER 31, 1931

Total attendance.....		1,515,540
Paid attendance.....	126,209	

Free admissions on pay days:

Students.....	15,960
School children.....	67,478
Teachers.....	1,868
Members.....	1,517

Admissions on free days:

Thursdays (53).....	293,654
Saturdays (52).....	407,303
Sundays (52).....	601,551

Highest attendance on any day (May 21, 1931).....	51,917
Lowest attendance on any day (March 9, 1931).....	130
Highest paid attendance (September 7, 1931).....	4,513
Average daily admissions (365 days).....	4,152
Average paid admissions (208 days).....	607

Number of guides sold.....	7,634
Number of articles checked.....	17,515
Number of picture post cards sold.....	138,514

Sales of publications, leaflets, handbooks, portfolios and photographs.....	\$5,351.54
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FINANCIAL STATEMENT

FOR THE YEAR ENDED DECEMBER 31, 1931

Endowment Fund income.....	\$197,873.35	
Less: Transferred to reserve against security investments — all funds.....	10,000.00	
		\$187,873.35
Income from funds held under annuity agreements.....	42,044.16	
Life Membership Fund income.....	14,824.77	
Associate Membership Fund income.....	13,491.20	
South Park Commissioners.....	167,860.43	
Annual and Sustaining Memberships.....	14,655.00	
Admissions.....	31,552.25	
Sundry receipts.....	11,715.67	
Contributions for general purposes.....	200,000.00	
Contributions for special purposes (expended <i>per contra</i>).....	110,944.82	
Special funds:		
Part expended this year for purposes created (in- cluded <i>per contra</i>).....	40,067.81	
		\$834,529.46
Expenditures:		
Collections.....	\$179,603.62	
Expeditions.....	34,868.69	
Furniture and fixtures, equipment, etc.....	24,461.58	
Plant reproduction.....	16,362.54	
Pensions, group insurance premiums, etc.....	17,918.03	
Research fellowship.....	1,000.00	
Departmental expenses.....	110,475.70	
General operating expenses.....	407,431.95	
Annuities on contingent gifts.....	40,176.23	
Added to principal of annuity endowments.....	1,867.93	
Interest on loans.....	7,574.58	
		\$841,740.85
Remaining excess of expenditures over income and receipts.....	\$ 7,211.39	
Notes payable, caused by this and previous years' operating deficits.....	\$184,800.00	

THE N. W. HARRIS PUBLIC SCHOOL EXTENSION

STATEMENT OF INCOME AND EXPENSES FOR THE YEAR 1931

Interest and dividends on investments.....	\$ 21,008.36
Operating expenses.....	19,028.69
Balance, December 31, 1931.....	\$ 1,979.67

LIST OF ACCESSIONS

DEPARTMENT OF ANTHROPOLOGY

AUCKLAND INSTITUTE AND MUSEUM, Auckland, New Zealand: 1 face mask of a Maori, with tattoo marks—Maori, New Zealand (exchange).

BADGER, MRS. A. SHREVE, Chicago: 23 objects—3 bows, 1 quiver with arrows, 2 pairs of moccasins, 4 beaded deer-skin bags, 1 deer-skin saddle-bag, 1 medicine-man's head-dress, 1 basket—Apache; 3 woolen blankets—Navaho; 1 basket—Hupa; 3 baskets—Hooquam, Washington; 1 basket bottle—Nevada; 1 yucca fiber pouch—Mexico; parts of abalone shell necklace—California, Arizona, Washington, Nevada, and Mexico (gift).

BADGER, MRS. FRANCES COWLES, Barrington, Illinois: 1 globular stone jar with band of incised designs—California (gift).

BAKER, C. L.: 1 boat-shaped prehistoric stone ax—Iola, Grimes County, Texas (gift).

BASSETT, CHARLES K., Buffalo, New York: 85 prehistoric arrow points and knives—Columbia River, Central Oregon (gift).

BECKMAN, CHARLES, Arlington, Oregon: 72 objects—prehistoric arrowheads, knives and pendants—Roosevelt, Klickitat County, Washington (gift).

BENSABOTT, R., INC., Chicago: 1 carved green jade box, K'ien-lung period (1736–95), 22 inscribed oracle bones, Shang dynasty (about 1500 B.C.)—China (gift).

BONIN, DR. GERHARDT VON, Chicago: 1 ink stone—China (gift).

BOUDEMAN, DONALD O., Kalamazoo, Michigan: 171 archaeological objects—8 stone pipes, 40 arrowheads, 3 grooved axes, 3 celts, 1 grooved maul, 1 roller pestle, 23 spearheads, 19 stone knives, 35 problematical objects of slate, 18 drills, 20 scrapers—Michigan (exchange).

BREUIL, ABBÉ HENRI, Paris, France: 41 prehistoric flint implements—Mas d'Azil, France (gift).

BUSH, MRS. WILLIAM H., Chicago: 1 glass snuff-bottle with landscape painting—China (gift).

CHAIT, RALPH M., New York: 1 large barrel-shaped pottery wine-jar, Han period—China (gift).

CHALMERS, WILLIAM J., Chicago: 1 pair of silver bracelets, 2 silver necklaces, 1 pair silver earrings, 2 enameled pendants, 1 gold charm with chain—Algeria and Morocco, North Africa (gift).

DICKSON, DR. DON F., Lewistown, Illinois: 29 specimens—1 skeleton, 2 skulls, 4 pieces of pottery, 2 shell spoons, 1 stone celt, 1 awl sharpener, 15 flint spearheads, arrowheads, etc., 1 flaker, 1 conch-shell ornament, 1 conch-shell bead—Illinois (gift).

DRUMMOND, DR. I. W., New York: 1 jade chape, 4 jade girdle pendants, 1 jade ring, 1 ivory funnel and ladle for snuff, 1 green glass charm with Arabic inscription, 1 jasper charm with Kufic inscription, 1 chisel—China, Near East, and Switzerland (gift).

EVERETT, MR. AND MRS. EDWARD W., Hinsdale, Illinois: 1 painting on silk representing a school of carp, sixteenth century—China (gift).

FIELD, MR. AND MRS. GEORGE W., Waukegan, Illinois: 71 prehistoric arrow and spear points, rejects, fragments, etc.—Illinois and Wisconsin (gift).

FIELD MUSEUM OF NATURAL HISTORY: Collected by Field Museum—Oxford University Joint Expedition to Mesopotamia (Marshall Field Fund): about 600 objects—flint, bone, and copper implements, beads, alabaster bowls, glass, stuccos and heads from Sassanian palaces, skeletal material—Kish, Mesopotamia.

Collected by Dr. Paul S. Martin, leader of Second Archaeological Expedition to the Southwest (Julius and Augusta N. Rosenwald Fund): 739 objects—76 pottery vessels, 2 pottery pipes, 1 pottery pendant, 625 pottery sherds, 10 bone awls, 10 prayer sticks, 2 strings of shell and bone beads, 10 butts of roof beams, 1 stone "sandal last," 1 lot of calcined maize, 1 lot of animal bones—Lowry ruin, Colorado.

Collected by Henry Field, leader of Second Marshall Field Archaeological Expedition to Europe: Prehistoric archaeological material—England, France, Germany, Czechoslovakia, Austria, and Hungary.

Collected by Henry Field, leader of Chauncey Keep Expedition to Europe: 102 objects—3 skulls, 6 casts of deformed skulls, 78 casts of heads, hands, and feet of various racial types, 15 hair samples of various races; 618 photographs of racial types.

Collected by J. Eric Thompson, leader of Third Marshall Field Archaeological Expedition to British Honduras: 371 objects—60 pottery vessels, 5 pottery figurines, 150 flints and obsidians, 35 shell, pumice, and coral objects, 30 jades, 13 bone objects, 10 stone objects, 60 miscellaneous objects, 8 ethnological objects—British Honduras and Guatemala.

Purchases: 1 flint spearhead—Visingo Island, Sweden, from Victor B. Lindgren, collector (Fund for Hall of Prehistoric Man); 1,528 objects—1,000 Solutrean flints, 10 pieces of worked bone, 18 pierced teeth and art objects, 500 animal bones—France, from Museum at Paray-le-Monial.

FIELD, STANLEY, Chicago: 23 bronze figures, busts and heads of racial types (gift).

FITCH, MRS. MARGARET S., Chicago: 1 piece of barkcloth, 1 dipper, 2 ladles, and 1 broom—Batonga, Portuguese East Africa (gift).

HERSKOVITZ, DR. MELVILLE J., Evanston, Illinois: 1 specimen of white edible clay—Dahomey, Africa (gift).

HURLEY, JORGE, Belém-Pará, Brazil: 2 stone axes and 2 feather head-bands—Gurupy, Pará, Brazil (exchange).

JOHNSTON, L. K., Knox, Indiana: 1 prehistoric stone ax, 1 scraper, 3 arrowheads—Northern Indiana (gift).

JONES, ROBERT B., Chicago: 1 grooved stone ax, 10 flint spearheads—Ridgeville, Indiana (gift).

KNOBLOCK, BYRON, La Grange, Illinois: 1 quartzite point of Folsom type—Wisconsin; 4 flint points, fragments of Indian skeleton—Kimmswick, Missouri; human skull and lower jaw—Pike County, Illinois (gift); 75 objects—23 prehistoric stone implements—Denmark; 8 discoidals, 4 celts, 4 problem-

atical stone objects, 1 bird stone, 1 plummet, 14 gorgets, 1 hematite ax, 1 stone tube, 6 stone pipes, 2 pottery pipes, 1 decorated shell, 9 French trade glass beads—Mississippi Valley (exchange).

LONG, LINUS, Chicago: 2 ceremonial jade axes, Sung and K'ien-lung periods—China (gift).

MOLLISON, PROFESSOR T., Munich, Germany: 49 objects—10 casts of prehistoric human and anthropoid bones, 3 fragments of human skeleton, 36 racial hair samples; 110 enlarged photographs of racial types (exchange).

MUSEUM OF THE UNIVERSITY OF PENNSYLVANIA, Philadelphia: 54 specimens of prehistoric pottery—Marajo and other islands at mouth of Amazon, Brazil; 1 iron pyrite mirror—Guatemala (exchange).

PARMELEE, MRS. WILLIAM B., Chicago: 3 paper carps used at boy's festival—Japan (gift).

PETRIE, PROFESSOR SIR FLINDERS, London, England: 2 hair samples from Egyptian mummies of Roman period—Egypt (gift).

POPE, DR. ARTHUR U., New York: 1 decorated bronze plaque (fragment)—Luristan, Persia (gift).

REED, JAMES BRITTON AND LAWRENCE BRITTON, Woodstock, Illinois: 24 prehistoric flint arrowheads and spearheads—Indian camp site on Clarion River, Pennsylvania (gift).

REID, JOHN T., Lovelock, Arkansas: 1 metate with grinder—Paiute, Humboldt Lake, Pershing County, Nevada (gift).

ROBERTS, MRS. J. W., Oswego, Illinois: 1 fragmentary Indian female skeleton—Oswego, Illinois (gift).

SCOTT, A. B., Chicago: 1 prehistoric stone ear plug—White River, Arkansas (gift).

SELLERS, PROFESSOR OVID R., Chicago: 1 lower mandible of member of Equidae from a reservoir of Hellenistic period (5th-3rd century B.C.)—Beth-Zur, Palestine (gift).

STARR, MRS. MERRITT, Winnetka, Illinois: 1 papoose cradle, 3 umbilical cord charms, 2 sheaths for knives, 1 awl case—Kiowa tribe, Oklahoma; 1 bow and 3 arrows—China (gift).

SWIFT, CHARLES H., Chicago: 1 beaded buckskin vest, 1 beaded belt—Menominee and Dakota Indians, United States (gift).

UNITED STATES NATIONAL MUSEUM, Washington, D.C.: 136 archaeological objects, chiefly bone, ivory, wooden implements, and pottery—Eskimo, Alaska (exchange).

VERNON, DAVID, Chicago: 19 objects—prehistoric ornamental stones and pottery pipe—Wisconsin, Illinois, Kentucky, Iowa, Tennessee, Michigan, and Georgia (exchange).

VON DRASEK, FRANK, Cicero, Illinois: 68 prehistoric arrowheads—Magnet Cove, Arkansas (gift).

WALKER, DR. JAMES W., Chicago: 1 knife with sheath—Mandingo, West Africa (gift).

WATELIN, L. C., Paris, France: 26 flint implements of Campignian period—Dordogne, France (gift).

WICKER, MISS CAROLYN, Chicago: 1 nest of boxes—Japan; 1 pair of flutes—hill tribes of Darjeeling, India; 12 post cards representing natives of Borneo—Japan, India, and Borneo (gift).

WOODBURY, EDMOND I., Burlington, Iowa: 3 caps, 3 bags, 1 body belt, 1 pair of gloves, and 2 dolls, all of wool—Aymara and Quechua, Peru (gift).

ZIMMER, JOHN, Chicago: 1 prehistoric stone pounder—Illinois (gift).

DEPARTMENT OF BOTANY

ABBOTT LABORATORIES, Chicago: 1 specimen of plant from Texas (gift).

ACADEMY OF NATURAL SCIENCES, Philadelphia, Pennsylvania: 2 specimens of plants (gift).

AMERICAN WRITING PAPER COMPANY, Holyoke, Massachusetts: 5 specimens showing steps in paper manufacture (gift).

ARNOLD ARBORETUM, Jamaica Plain, Massachusetts: 387 specimens of plants (exchange).

ARTHUR, DR. J. C., Lafayette, Indiana: 1 specimen of plant from Texas (gift).

BACON, R. S., COMPANY, Chicago: 10 veneered panels of foreign woods, 1 board Maidhu crotch (gift).

BAILEY, MRS. DANA K., Aripine, Arizona: 1 specimen of plant from Arizona (gift).

BAILEY, J. W., Laurel, Mississippi: 4 trunk slabs, 1 wheel section, and 2 boards of sycamore (gift).

BAILEY, DR. L. H., Ithaca, New York: 250 plant specimens (gift).

BEBB, HERBERT, Chicago: 1 plant specimen (gift).

BENKE, HERMANN C., Chicago: 11 specimens of plants (gift).

BERST-FORSTER-DIXFIELD COMPANY, Cloquet, Minnesota: 1 trunk, 1 wheel section, and 2 boards of paper birch (gift).

BISHOP MUSEUM, BERNICE P., Honolulu, Hawaii: 1 plant specimen from the Galapagos Islands (gift).

BOND, RALPH A., Chicago: 1 board of ipil (gift).

BOTANIC GARDEN AND MUSEUM, Berlin-Dahlem, Germany: 261 specimens of plants, 90 tracings (exchange).

BRAVO H., MISS HELIA, Chapultepec, Mexico: 2 plant specimens (gift).

BROOKLYN BOTANIC GARDEN, Brooklyn, New York: 12 plant specimens, 1 packet of seeds (exchange).

CABRERA, PROFESSOR ANGEL L., La Plata, Argentina: 5 specimens of plants (gift).

CAIN, PROFESSOR STANLEY A., Indianapolis, Indiana: 37 specimens of plants (gift).

CALDERON, DR. SALVADOR, San Salvador, Salvador: 63 specimens of plants (gift).

CALIFORNIA ACADEMY OF SCIENCES, San Francisco: 17 specimens of plants from the Galapagos Islands (exchange); 3 plant specimens (gift).

CATHOLIC UNIVERSITY OF AMERICA, Washington, D.C.: 275 plant specimens (exchange).

CLARKSON, MRS. RALPH, Chicago: 4 specimens of plants (gift).

CLEMENS, MRS. JOSEPH, Kew, Surrey, England: 1 tracing of plant (gift).

COMPANHIA FORD INDUSTRIAL DO BRASIL, Pará, Brazil: 228 plant specimens from Brazil (gift).

CONSERVATOIRE ET JARDIN BOTANIQUE, Geneva, Switzerland: 79 specimens of South American plants (exchange).

CONSERVATOR OF FORESTS, Belize, British Honduras: 62 wood samples (gift).

CORTI, GIULIO AND FILLO, Signa, Italy: 15 samples of hats and hat-making materials (gift).

COX, F. NOTTER, Berkeley, California: 1 plant specimen (gift).

CREWS, IRA D., Tulsa, Oklahoma: 1 log section, 1 wheel section, and 2 boards of Osage orange (gift).

DAVIDSON, MRS. S. B., San Francisco, California: 1 specimen of acorn from Panama (gift).

DEAM, C. C., Bluffton, Indiana: 6 specimens of Indiana plants (gift).

DELTOX RUG COMPANY, Oshkosh, Wisconsin: 3 specimens of sedge mats, twine, and plants (gift).

DUDLEY HERBARIUM, Stanford University, California: 412 specimens of plants (exchange).

FIELD MUSEUM OF NATURAL HISTORY: Collected by Dr. B. E. Dahlgren (Marshall Field Botanical Expedition to the Amazon, 1929): 2 specimens of *Copernicia* baskets from Brazil.

Collected by Dr. Ralph Linton (Marshall Field Expedition to Madagascar): 8 specimens of raffia mats.

Rockefeller Foundation Fund for Photographing Type Specimens: 8,925 negatives of type specimens of the Berlin, Munich, and Geneva herbaria.

Transferred from the Division of Photography: 5,669 photographic prints.

Purchases: 200 specimens of Chilean plants, collected by K. Behn; 115 specimens of plants from Trinidad, collected by W. E. Broadway; 100 specimens of Patagonian plants, collected by Dr. Arturo Donat; 81 specimens of plants collected in Venezuela by W. Gehriger; 100 specimens of Chilean plants, collected by Hugo Gunckel; 55 specimens of plants collected in Uruguay by Dr. Guillermo Herter; 520 specimens of plants collected in western United

States by C. L. Hitchcock; 964 specimens of plants collected in Paraguay by Pedro Jorgensen; 496 specimens of plants collected in Peru and Colombia by G. Klug; 200 specimens of Brazilian plants, collected by Dr. Bento Pickel; 95 specimens of Venezuelan plants, collected by José Saer; 311 specimens of Brazilian ferns, collected by J. P. Schmalz; 145 specimens of plants collected in the Dominican Republic by E. J. Valeur; 311 specimens of Rubiaceae, chiefly from Europe and Africa; 70 photographic prints of types of *Aegiphila*; 13 economic specimens.

FISHER, GEORGE L., Houston, Texas: 221 specimens of plants from Texas and New Mexico (gift).

FLORES, DR. ROMÁN S., Progreso, Yucatan: 9 specimens of plants, 3 photographic prints, 1 wood specimen (gift).

FLORIDA-LOUISIANA RED CYPRESS COMPANY, Jacksonville, Florida: 2 "knees" of southern cypress (gift).

FOX, ALLOTT M., Iron Mountain, Michigan: 1 board of sugar maple, 1 trunk of tamarack (gift).

FRANK, S. H., Redwood City, California: 1 specimen of tanbark (gift).

FRITZ, PROFESSOR EMANUEL, Berkeley, California: 6 boards and 4 cones of sugar pine, 1 board of Monterey cypress, 1 board of eucalyptus (gift).

GARFIELD PARK CONSERVATORY, Chicago: 1 specimen of bamboo (gift).

GARRETT, PROFESSOR A. O., Salt Lake City, Utah: 48 specimens of plants (gift).

GILLETT SAFFRON COMPANY, Chicago: 1 specimen saffron (gift).

GRAMS, WILLIAM F. C., Des Plaines, Illinois: 1 plant specimen, 2 packets of seeds (gift).

GRAY HERBARIUM OF HARVARD UNIVERSITY, Cambridge, Massachusetts: 789 specimens of plants (exchange).

GREAT SOUTHERN LUMBER COMPANY, Bogalusa, Louisiana: 2 boards of long-leaf pine (gift).

GRONEMANN, CARL F., Elgin, Illinois: 5 plant specimens (gift).

HAISLER BROTHERS COMPANY, Chicago: 8 specimens of brush and broom material (gift).

HARPER, DR. R. M., Tallahassee, Florida: 8 specimens of plants (gift).

HART, MRS. EDWARD S., Hartford, Connecticut: 2 specimens of plants (gift).

HELLMAYR, DR. C. E., Chicago: 26 specimens of orchids (gift).

HERCULES POWDER COMPANY, Wilmington, Delaware: 1 sample of abietic acid (gift).

HERRERA, PROFESSOR FORTUNATO L., Cuzco, Peru: 33 specimens of Peruvian plants (gift).

HEYWOOD-WAKEFIELD COMPANY (branch), Chicago: 1 chair seat (gift).

HEYWOOD-WAKEFIELD COMPANY (home office), Gardner, Massachusetts: 1 chair seat (gift).

HINES, EDWARD, LUMBER COMPANY, Burns, Oregon: 2 boards of western larch (gift).

HOFFMANN, RALPH, Santa Barbara, California: 105 specimens of California plants (gift).

IMPERIAL BROOM COMPANY, Chicago: 4 specimens of broom materials (gift).

INTERNATIONAL HARVESTER COMPANY, Chicago: 5 samples of manila and sisal fiber (gift).

INTERNATIONAL PAPER COMPANY, New York: 10 specimens of Brazilian pulpwoods (gift).

ITALIAN CHAMBER OF COMMERCE, Chicago: straw hat material.

JARDIN BOTANIQUE PRINCIPAL, Leningrad, U.S.S.R.: 105 specimens of plants from Mexico and Guatemala (exchange).

JUST, DR. TH., Notre Dame, Indiana: 1 specimen of Indiana plant (gift).

KALAMAZOO VEGETABLE PARCHMENT COMPANY, Kalamazoo, Michigan: 5 specimens of paper-making material (gift).

KARLING, J. S., New York: 3 specimens of plants from British Honduras (gift).

KEITH LUMBER COMPANY, Chicago: 1 board of sycamore (gift).

KING, W. O., LUMBER COMPANY, Chicago: 2 boards of sugar maple (gift).

KUTTNAUER AND FRANKE, Chicago: 7 tobacco samples (gift).

LANG, HERBERT, Pretoria, South Africa: 40 photographic prints (gift).

LANKESTER, C. H., Cartago, Costa Rica: 81 plant specimens from Costa Rica (gift).

LAUFER, MRS. BERTHOLD, Chicago: 1 basket (gift).

MACBRIDE, J. FRANCIS, Chicago: 8 specimens of plants from Switzerland (gift).

MCCURRACH, JAMES, Evanston, Illinois: 1 plant specimen (gift).

MARSHALL FIELD AND COMPANY, Chicago: 7 specimens of fiber rugs and matting, 2 specimens of hat material (gift).

MEXIA, MRS. YNES, San Francisco, California: 81 specimens of plants from Brazil and Mexico (gift).

MEYER, JOHN H., AND SON, Chicago: 20 tobacco samples (gift).

MEYER, WILLIAM C., New York: 147 specimens of British Honduras plants (gift).

MISSOURI BOTANICAL GARDEN, St. Louis, Missouri: 1,987 specimens of plants from southwestern United States (exchange).

MOLDENKE, HAROLD N., New York: 4 photographic prints, 3 descriptions of plants from *Flora Fluminensis* (gift).

MONARCH LEATHER COMPANY, Chicago: 4 leather samples (gift).

NATIONAL HERBARIUM OF VICTORIA, South Yarra, Australia: 50 specimens of Australian plants (exchange).

NEILS, J., LUMBER COMPANY, Libby, Montana: 7 wood specimens (gift).

NEW YORK BOTANICAL GARDEN, Bronx Park, New York: 249 photographic prints, 2 plant specimens (exchange).

NIEUWLAND, REV. J. A., Notre Dame, Indiana: 1 specimen of orchid from Michigan (gift).

ORTEGA, JESÚS GONZÁLEZ, Mazatlán, Mexico: 200 specimens of Sinaloa plants (gift).

OSTERHOUT, GEORGE E., Windsor, Colorado: 2 specimens of Colorado plants (gift).

PALM, PROFESSOR BJORN, Urbana, Illinois: 28 plant specimens (gift).

PHILLIPS, D. O., Little Rock, Arkansas: 1 plant specimen (gift).

PORSILD, DR. MORTEN P., Disko, Greenland: 365 specimens of plants from Greenland (exchange).

PROBST, DR. R., Langendorf, Switzerland: 48 specimens of adventive plants from Switzerland (gift).

RAEDLEIN BASKET COMPANY, Chicago: 1 specimen of basketry material (gift).

RAMÍREZ, PROFESSOR ANTONIO, Chapultepec, Mexico: 1 specimen of Mexican plant (gift).

RHOADES, WILLIAM, Indianapolis, Indiana: 89 plant specimens (exchange).

RICHMOND CEDAR COMPANY, Richmond, Virginia: 1 trunk and 2 boards of southern white cedar (gift).

RIKMUSEETS BOTANISKA AFDELNING, Stockholm, Sweden: 1,336 specimens of plants (exchange).

ROZYNSKI, H. W. VON, Jaumave, Mexico: 135 specimens of Mexican plants (gift).

SALAS, JORGE GARCÍA, Guatemala City, Guatemala: 41 specimens of plants from Guatemala (gift).

SCHIPP, WILLIAM A., Belize, British Honduras: 155 specimens of plants from Honduras (gift).

SCHOBLE, FRANK, AND COMPANY, New York: 23 samples of hats and hat-making materials (gift).

SEATTLE CEDAR LUMBER MANUFACTURING COMPANY, Seattle, Washington: 4 trunks, 1 wheel section, and 2 boards of western red cedar (gift).

SERRARIA FREITAS DIAS E COMPANHIA, Belem, Pará, Brazil: 3 wood specimens (gift).

SHAMBOW SHUTTLE COMPANY, Woonsocket, Rhode Island: 1 shuttle of persimmon wood, 1 shuttle of dogwood (gift).

SHERFF, DR. EARL E., Chicago: 15 plant specimens (gift).

SMITH, J. H., VENEERS, INC., Chicago: 116 veneered panels of foreign woods (gift).

SPENCE, HOWARD, Southport, England: 3 wood specimens (gift).

STANDLEY, PAUL C., Chicago: 17 specimens of Indiana plants (gift).

STETSON, JOHN B., COMPANY, Philadelphia, Pennsylvania: 13 samples of hats and hat-making materials (gift).

STEVENS, PROFESSOR O. A., State College Station, Fargo, North Dakota: 2 specimens of North Dakota plants (gift).

STEYERMARK, JULIAN A., St. Louis, Missouri: 1 plant specimen from Texas (gift).

TORRES R., PROFESSOR RUBEN, Cartago, Costa Rica: 1 plant specimen from Costa Rica (gift).

UNITED STATES DEPARTMENT OF AGRICULTURE, BUREAU OF PLANT INDUSTRY, Washington, D.C.: 1 specimen of cotton bolls (gift).

UNITED STATES DEPARTMENT OF AGRICULTURE, OFFICE OF SYSTEMATIC AGROSTOLOGY, Washington, D.C.: 289 specimens of grasses (exchange).

UNITED STATES NATIONAL MUSEUM, Washington, D.C.: 1,063 specimens of plants, 500 photographic prints of plants (exchange).

UNIVERSAL FILM EXCHANGE, INC., Chicago: 1 specimen of moving picture film (gift).

UNIVERSITETETS BOTANISKE MUSEUM, Copenhagen, Denmark: 83 plant specimens from Mexico and Central America (exchange).

UNIVERSITY OF CALIFORNIA, DEPARTMENT OF BOTANY, Berkeley, California: 854 specimens of plants (exchange).

UNIVERSITY OF CALIFORNIA AT LOS ANGELES, DEPARTMENT OF BOTANY, Los Angeles, California: 599 specimens of plants (exchange).

UNIVERSITY OF CHICAGO, DEPARTMENT OF BOTANY, Chicago: 353 specimens of plants (gift).

UNIVERSITY OF MICHIGAN, DEPARTMENT OF BOTANY, Ann Arbor, Michigan: 1,098 specimens of plants from Mexico and Sumatra (exchange).

UNIVERSITY OF WASHINGTON, DEPARTMENT OF BOTANY, Seattle, Washington: 102 specimens of plants from Alaska (gift).

VAN CLEEF, PAUL, Chicago: 1 trunk of a rubber tree, 1 sample of rubber (gift).

WILLIAMS, I. T., AND SONS, New York: 8 specimens of mahogany and teak (gift).

WILLIAMS, R. O., Port-of-Spain, Trinidad: 2 specimens of Trinidad plants (gift).

WILLIAMSON VENEER COMPANY, Baltimore, Maryland: 2 boards of Santa María (gift).

WILSON, PROFESSOR C. L., Hanover, New Hampshire: 135 specimens of Barro Colorado Island plants (gift).

WITE MEMORIAL MUSEUM, San Antonio, Texas: 54 specimens of Texas plants (gift).

WORTHINGTON, DR. HARRY C., Oak Forest, Illinois: 1 plant specimen (gift).

YALE UNIVERSITY, SCHOOL OF FORESTRY, New Haven, Connecticut: 83 specimens of plants, 30 photographic prints (gift); 121 wood specimens (exchange).

ZAPHIRIO, A., AND COMPANY, Chicago: 7 tobacco samples (gift).

ZETEK, JAMES, Balboa, Canal Zone, Panama: 928 specimens of plants from Barro Colorado Island (gift).

ZIMMERMAN, H. E., Mt. Morris, Illinois: 1 plant specimen (gift).

ZINGG, ROBERT M., Chicago: 41 specimens of plants from Chihuahua (gift).

DEPARTMENT OF GEOLOGY

ALDRICH, JACK, Oak Park, Illinois: 1 specimen fossil coral—Delavan, Wisconsin (gift).

AMERICAN GEM AND PEARL COMPANY, New York: Cluster of amazonite crystals—Virginia (gift).

AMERICAN MUSEUM OF NATURAL HISTORY, New York: 5 photographs (gift).

BARNES, R. M., Lacon, Illinois: Marcasite concretion—Lacon, Illinois (gift).

BERGHOEFER, REV. FREDERICK J., Chicago: 3 specimens gas-bearing sand—Lake Forest, Illinois (gift).

BIANCHI, JOSEPH, Paterson, New Jersey: 4 specimens minerals—New Jersey (exchange).

BIGANE, JOHN, AND SONS, Chicago: 3 specimens fossil plants—Nanticoke, Pennsylvania (gift).

BLASCHKE, FREDERICK, Cold Spring-on-Hudson, New York: Model of the horse "Man o' War" (gift).

BOREMAN, K. S., Chicago: 1 specimen halite—Washington County, Utah (gift).

BRITISH MUSEUM (NATURAL HISTORY), London, England: 3 specimens Cambrian trilobites—Wales (exchange).

CHALMERS, WILLIAM J., Chicago: 2 silver bricks—Colorado and Montana; group of crystallized cuprite—Bisbee, Arizona; 8 specimens crystallized minerals—Maine and New Mexico; 1 varicolored tourmaline—Madagascar (gift).

CHAIT, RALPH M., New York: 2 specimens chalcedony geodes—Uruguay (gift).

CLINTON, H. G., Manhattan, Nevada: 21 specimens minerals—Manhattan, Nevada (exchange).

COMER, JOSEPH, Rose Lawn, Indiana: Lower jaw of fossil beaver—Mount Ayr, Indiana (gift).

CORAM, GEORGE M., Utica, New York: 1 specimen "box crystal"—Port Leyden, New York (gift).

CRANE, RICHARD T., JR., Chicago: 1 cut ruby topaz—Brazil; 1 polished black opal—Australia (gift).

CURTIS, THEODORE H., Chicago: 2 specimens sand-lime concretions—Adams County, South Dakota (gift).

DAVIS, HARRY T., Raleigh, North Carolina: Etched fragment of Randolph County meteorite—North Carolina (gift).

DINGELDEIN, KARL, New York: 1 specimen carved amazonite—Amelia Court House, Virginia (exchange).

EGGERS, HERMAN C., Hamburg, Germany: 5 photographs illustrating desert phenomena—Chile (gift).

EIFRIG, C. W. G., River Forest, Illinois: Bones of fossil vertebrates—Cumberland, Maryland (exchange).

EHRMANN, MARTIN L., New York: Large carved fluorite vase—Cumberland, England (gift).

FABER, E. B., Grand Junction, Colorado: 2 specimens fossil pelecypods, 4 specimens fossil gastropods, fossil amblypod jaw—Grand Junction, Colorado (gift).

FIELD, HENRY, Chicago: 16 specimens rock types—Inverness, Scotland (gift).

FIELD MUSEUM OF NATURAL HISTORY: Collected by Dr. O. C. Farrington: 67 specimens minerals—Maine.

Collected by the Marshall Field Paleontological Expedition to Argentina and Bolivia, 1923-27: Chalcedony geode—Patagonia; 28 skulls and skeletons of South American fossil mammals and birds—Argentina and Bolivia.

Collected by the Marshall Field Paleontological Expedition to Nebraska: 48 specimens vertebrate fossils—Nebraska.

Collected by the Rawson-MacMillan-Field Museum Subarctic Expedition of 1927-28: 23 specimens invertebrate fossils—Labrador.

Collected by various expeditions: 14 skulls and other bones of modern animals.

Purchases: 1 iron meteorite—Breece, New Mexico; section of Newport meteorite—Newport, Arkansas; septarium of hematite—Vandalia, Missouri; set of gases of the atmosphere; 20 species of Middle Miocene fossil leaves and flowers—Harney County, Oregon; horn of fossil bison—Gage, Oklahoma; 2 skulls and other skeletal parts of *Protitanotherium*—Vernal, Utah; partial skeleton of fossil crocodile—Vernal, Utah; mounted head of *Porthus*—Hays, Kansas; 2 natural casts of dinosaur tracks—Grand Junction, Colorado; 6 specimens invertebrate fossils—Bundebach, Germany.

FISHER, G. L., Houston, Texas: 1 photograph of lava beds—Carrizozo, New Mexico (gift).

FREEPORT SULPHUR COMPANY, Freeport, Texas: 4 specimens sulphur, 4 charts—Freeport, Texas (gift).

FRIESSER, JULIUS, Chicago: 1 skull of American bison—Iowa; 1 skull of black rhinoceros—Florida (gift).

GENERAL BIOLOGICAL SUPPLY HOUSE, Chicago: 1 specimen modern squid—Florida (gift).

GIBBONS, PATRICK, Lewiston, Idaho: Photograph of opal—Idaho (gift).

GLOSKI, JOSEPH A., Brentwood Heights, California: 269 specimens agate—California (gift).

GRAHAM, ERNEST R., Chicago: 28 mural paintings (gift).

GREEN, MORRIS M., Ardmore, Pennsylvania: Fossil shark's tooth—near Charleston, South Carolina; fossil pelecypod—Columbus, Mississippi (gift).

HAWKES, J. K., Kansas City, Missouri: 5 specimens transparent gypsum—Barton County, Oklahoma (gift).

JOHN, E. W., Clear Lake, Utah: 7 specimens fossil invertebrates—Utah (gift).

JONES, A. C., Cicero, Illinois: 1 group of fossil brachiopods—Mayville, Wisconsin; 1 specimen aragonite—Colorado (gift).

JONES, ROBERT B., Chicago: 15 specimens minerals, 3 specimens invertebrate fossils—Various localities (gift).

KAEMPFER, ANTON C. G., Bridgeport, Nebraska: Right mandible and symphysis of *Trilophodon*—Bridgeport, Nebraska (gift).

LECHLER, E. FRED, Chicago: 1 specimen sandstone with intersecting veins—Wisconsin (gift).

LETL, FRANK; LETL, PAUL; MASON, MISS NAN; PATTERSON, BRYAN, Chicago: 26 specimens fossil plants and insects, 1 specimen septarium—Braidwood, Illinois (gift).

LINNEMAN, JOSEPH P., Buffalo, New York: 1 specimen galena and calcite—Nevada; 1 specimen wad—Ottawa, Canada (gift); 13 specimens minerals—Various localities (exchange).

LIPMAN, ROBERT R., Chicago: Cluster of calcite crystals—Gunnison County, Colorado (gift).

LOS ANGELES MUSEUM OF HISTORY, SCIENCE, AND ART, Los Angeles, California: 1 skeleton each of fossil horse, bison, sloth and carnivore—Los Angeles, California (exchange).

MARINER AND HOSKINS, Chicago: 1 specimen magnetite, apatite and calcite—Wilberforce, Ontario (gift).

MUELLER, E. A., Chicago: 127 specimens fulgurites—Saugatuck, Michigan; 174 specimens fulgurites, 1 photograph—Ableman, Wisconsin (gift).

MUHR, ROY, Redington, Nebraska: Cranium of *Trilophodon*—Bridgeport, Nebraska (gift).

MUSÉE ROYAL D'HISTOIRE NATURELLE DE BELGIQUE, Brussels, Belgium: Skull and jaws of *Rhinoceros tichorhinus*—Malines, Belgium (exchange).

NEVILLE, RUSSELL T., Kewanee, Illinois: Photograph of stalagmite on wood—Sullivan, Missouri; 10 photographs of cave formations—Various localities (gift).

NEW YORK ZOOLOGICAL SOCIETY, New York: 1 photograph of Asiatic horse (gift).

NININGER, H. H., Denver, Colorado: Etched section of the Tacubaya meteorite—Tacubaya, Mexico (exchange); section and cast of Brule meteorite—Brule, Nebraska (exchange and purchase).

NOBLE, STUART D., Minneapolis, Minnesota: 9 specimens cut gems—Brazil and Australia (exchange).

PALM, JOHN, Lakeside, Michigan: 1 specimen bog iron ore—Rolling Prairie, Indiana (gift).

PHILLIPS, D. L., Little Rock, Arkansas: 10 specimens fossil resin, 7 specimens lignite impregnated with resin—near Gifford, Arkansas (gift).

PITTS, WILLIAM B., Sunnyvale, California: 2 polished specimens of oolite and jasper—California; 3 rock and mineral specimens—Nevada (gift).

POUGH, FREDERICK H., St. Louis, Missouri: 1 specimen volborthite—Stanton, Missouri (gift).

RANEZEEL, WALTER ANTHONY, Los Angeles, California: 4 photographs of rock pillars produced by erosion—Death Valley, California (gift).

REID, JOHN T., Lovelock, Nevada: 2 specimens mercury and antimony ores, 1 specimen dendrite, 8 specimens concretions, 1 specimen fossil mollusk—Nevada (gift).

SELLERS, GILBERT, Chicago: Ironstone concretion—Avon, Illinois (gift).

SINCLAIR, WILLIAM J., Princeton, New Jersey: Photograph of restoration of *Eohippus* (gift).

STAUFFER CHEMICAL COMPANY OF TEXAS, Freeport, Texas: 3 specimens sulphur—Freeport, Texas (gift).

STEWART, W. G., Salida, Colorado: 10 specimens minerals—Colorado (gift).

SWANK, RICHARD C., Chicago: 1 specimen clay concretion—Kansas (gift).

SWEET, S. R., Bridgeport, Nebraska: 7 specimens skulls and jaws of fossil vertebrates—Bridgeport, Nebraska (gift).

TRICKETT, O., North Sydney, New South Wales: Map of Jenolan caves—Australia (gift).

VON DRASEK, FRANK, Cicero, Illinois: 100 specimens minerals and rocks, 5 specimens cut quartz, 9 photographs illustrating diamond mining—Arkansas (gift); 6 specimens quartz—Arkansas (exchange).

WALKER, MRS. C. B., Sioux Falls, South Dakota: 29 photographs—Alberta, Canada (gift).

WALTHER, HERBERT C., Chicago: 26 specimens rare metals (gift).

WARD'S NATURAL SCIENCE ESTABLISHMENT, Rochester, New York: Polished section with crust of Adams County meteorite—Colorado (exchange and purchase).

WENDLER, C., Geneva, Switzerland: Mass with crust of Olmedilla stone meteorite—Olmedilla de Alarcon, Spain (exchange).

WESTERN BORAX COMPANY, LTD., Los Angeles, California: 1 specimen borax ore—Kramer, California (gift).

WILLIAMS, C. S., Chicago: 1 fossil crinoid—Mission Creek, Illinois (gift).

DEPARTMENT OF ZOOLOGY

ABBOTT, THOMAS R., Peiping, China: 35 crickets—China (gift).

ABSOLON, DR. KARL, Brünn, Czechoslovakia: 2 cave salamanders—Czechoslovakia (gift).

ALBRECHT, C. J., Homewood, Illinois: 1 house cricket—Illinois (gift).

ANDERSSON, LIEUTENANT K. S., Canal Zone, Panama: 2 snakes, 2 lizards, 2 bats—Panama (gift).

BAKER, J. S., Charlevoix, Michigan: 1 walking stick—Michigan (gift).

BAUM, JAMES E., JR., Lake Forest, Illinois: 4 Persian goats, 2 wild asses—Persia (gift).

BENESH, BERNARD, North Chicago, Illinois: 103 beetles—United States, Brazil, and Germany (gift).

BENNETT, PROFESSOR RUDOLPH, Columbia, Missouri: 1 Fowler's toad—Cole County, Missouri (gift).

BEREK, FRANK J., Chicago: 1 rattle-snake—Wheeling, Illinois (gift).

BIRKS, THOMAS K., Chicago: 2 snakes—Okee, Wisconsin (gift).

BOEHM, O. W., Chicago: 4 ichneumon flies—Indianapolis, Indiana (gift).

BRANDER, A. A. DUNBAR, Elgin, Scotland: 2 mounted birds, 17 birdskins—England (gift).

BRITISH MUSEUM (NATURAL HISTORY), London, England: 108 mammal skins and skulls—Asia, Africa, Australia, South America (exchange).

BURT, DR. CHARLES E., Winfield, Kansas: 1 gecko—Garagoa, Colombia; 17 salamanders, 104 frogs and toads, 13 lizards, 8 snakes—Texas; 14 frogs and toads, 10 lizards, 6 snakes—Various localities (gift).

CARSLEY, HAROLD, Waukegan, Illinois: 4 beetles—Beach, Illinois (gift).

CHEN, DR. K. K., Indianapolis, Indiana: 5 Japanese toads—Tokyo, Japan (gift).

CINCINNATI SOCIETY OF NATURAL HISTORY, Cincinnati, Ohio: 39 salamanders—North Carolina and Tennessee (exchange); 2 salamanders—Grandfather's Mountain, North Carolina (gift).

CLARK, P. B., San Francisco, California: 12 Alaskan blackfish—Bristol Bay District, Alaska (gift).

CLOW, HARRY, Plainfield, Illinois: 1 tiger salamander—Illinois (gift).

COCKERELL, PROFESSOR T. D. A., Boulder, Colorado: 2 shells—New Caledonia; 1 lot scale insects—Manila, Philippine Islands (gift).

COLE, R. V., Blanchard, Louisiana: 1 beetle—Blanchard, Louisiana (gift).

CONOVER, H. B., Chicago: 3 doves—Costa Rica and Panama (gift); 70 birdskins—Ecuador (exchange); 6 ducks—Marshall County, Illinois (gift); 6 quail—Sonora, Mexico (exchange); 1 Canada goose—Currituck Sound, North Carolina (gift); 2 hawks—Mosquerula, Spain; 102 birdskins—Various localities (exchange).

CRONICAN, MRS. W. P., Homewood, Illinois: 1 fox snake—Illinois (gift).

DANIEL, MRS. NORA, Kuttawa, Kentucky: 1 horned corydalis—Kentucky (gift).

DAVIS, D. DWIGHT, Naperville, Illinois: 13 mammals, 28 frogs and toads, 1 turtle, 4 snakes—Houston County, Minnesota; 1 Franklin ground squirrel, 1 snake—Naperville, Illinois (gift).

DAVIS, T. GUNNING, Chicago: 1 squirrel monkey—Paraguay (gift).

EIGSTI, E. W., Matteson, Illinois: 1 cicada—Illinois (gift).

ERWIN, RICHARD P., Boise City, Idaho: 7 bugs, 1 beetle—Idaho (gift).

EVERARD, R. H., Arusha, Africa: 1 scaly anteater—Tanganyika Territory, Africa (gift).

FIELD, HENRY, Chicago: 1 chiton—California; 4 scorpions, 6 jointed spiders—Rutba Post, Iraq (gift).

FIELD, MARSHALL, New York: 4 lions—Africa (gift).

FIELD MUSEUM OF NATURAL HISTORY: Collected by C. J. Albrecht (Harold White—John Coats Abyssinian Expedition of Field Museum): 12 ants—Gelata River, Abyssinia.

Collected by George G. Carey, Jr., and George F. Ryan (Carey—Ryan Expedition to Indo-China): 3 mammal skins and skulls, 1 box accessories—Indo-China.

Collected by Philip M. Chancellor (Chancellor—Field Museum Expedition to Aitutaki Island): 1 gecko, 210 fishes, 148 lower invertebrates—Aitutaki Island, Cook Archipelago.

Collected by Daniel Clark: 284 ticks—Various localities.

Collected by C. Suydam Cutting, Herbert Stevens, V. S. La Personne (C. Suydam Cutting Sikkim Expedition): 465 mammal skins and skulls, 1,379 birds, 6 frogs, 59 lizards, 39 snakes, 23 fishes, 1 scorpion—Sikkim, Darjeeling, Bengal, India.

Collected by Henry Field (Third Marshall Field Archaeological Expedition to Europe): 1 beaver skull.

Collected by W. D. Hambly (Friederick H. Rawson-Field Museum Ethnological Expedition to West Africa): 4 mammal skins without skulls, 2 insects—Angola, Africa.

Collected by Dr. A. W. Herre (Crane Pacific Expedition of Field Museum): 3,850 fishes—Canal Zone and Pacific Ocean.

Collected by Ashley Hine (Field Museum Ornithological Expedition to California): 177 birds, 1 bird's nest—California.

Collected by John Moyer: 3 birds—Pistakee Bay, Illinois.

Collected by John Moyer and W. A. Weber: 11 birds—Sparland, Illinois.

Collected by Bryan Patterson (Marshall Field Paleontological Expedition to Nebraska): 144 insects—Nebraska.

Collected by Colin C. Sanborn (Marshall Field Brazilian Expedition): 15 shells—Matto Grosso, Brazil.

Collected by Arthur S. Vernay, Herbert Lang, and Allan Chapman (Vernay-Lang Kalahari Expedition): 185 mammal skins and skulls, 12 large mammal skeletons—Angola and Kalahari Desert, Africa.

Collected by Harold A. White and John Coats (Harold White-John Coats Central African Expedition): 25 mammal skins—Kenya Colony, Africa.

Purchases: 39 small mammal skins and skulls, 9 native mammal skins, 1 crane—Northwestern Rhodesia, Africa; 6 frogs, 25 lizards, 10 snakes, 3 turtles, 2 scorpions, 3 insects—Kleinsee, South Africa; 3 Goliath frogs, 2 haired frogs—Cameroons, West Africa; 7 weasel skins and skulls—Point Barrow, Alaska; 22 small mammal skins and skulls—Tucuman, Argentina; 23 rodent skins and skulls—Western Argentina; 3 birds—Huachuca Mountains, Arizona; 1 marsupial anteater skin and skeleton, 1 rodent, 6 mammal embryos, 30 frogs, 94 lizards, 7 snakes, 2 turtles—West Australia; 1 cave salamander—Austria; 248 birds—Goyaz, Brazil; 5 ratfish—Pacific Grove, California; 7 birds—Drahgumna, China; 56 mammal skins and skulls, 293 birds—Fukien, China; 19 frogs and toads, 23 lizards—Choco District, Colombia; 122 mammal skins and skulls—Costa Rica; 10 salamanders

—Italy and Roumania; 6 cusk eels—Pass a L'Outre, Louisiana; 17 fishes—Gulf of Mexico; 2 European glass snakes, 2 European pond turtles—Dalmatia, Austria; 1 salamander, 2 tree frogs, 1 snake—Biloxi, Mississippi; 2 snakes—Atlas Mountains, Morocco; 1 wildcat skin and skeleton—Inverness, Scotland; 1 tawny owl (mounted), 37 birds—Teruel, Spain; 2 mouse-hare skins and skulls, 2 yellow-throated martens—Tibet; 6 salamander and snake reproductions.

FIKAR, CHARLES, Cicero, Illinois: 1 mud puppy—Fox River, Illinois (gift).

FRANZEN, A. J., Chicago: 1 prairie horned lark—Orland, Illinois; 1 garter snake—Peotone, Illinois; 17 insects—Illinois, Iowa and Wisconsin (gift).

FRANZEN, A. J. AND LAYBOURNE, E. G., Chicago: 12 salamanders, 3 fishes—Turkey Run, Indiana (gift).

FRIESSER, JULIUS, Chicago: 2 sphinx moths—Chicago (gift).

FRINTZ, RALPH, Homewood, Illinois: 1 tiger salamander—Homewood, Illinois (gift).

FURNESS, VISCOUNT, Invernesshire, Scotland: 2 Scotch red deer—Invernesshire, Scotland (gift).

GENERAL BIOLOGICAL SUPPLY HOUSE, Chicago: 1 pocket gopher skin without skull—San Jose, Illinois; 1 salamander—Georgia; 1 nurse shark egg—Key West, Florida; 1 scarlet king snake—Florida; 1 brown bat—Dubuque, Iowa; 6 frogs—Minnesota; 2 crayfish frogs—Louisiana; 2 salamanders, 2 frogs, 2 lizards, 1 snake—Brazil; 12 guppies—St. Croix, Virgin Islands; 1 lizard, 1 California salamander, 1 western hog-nosed snake—Various localities (gift).

GERHARD, W. J., Chicago: 71 insects—Colorado and Illinois (gift).

GRANT, MAJOR CHAPMAN, San Juan, Porto Rico: 21 frogs—Porto Rico (gift).

GRANT, C. P., Chicago: 1 red fox skull—Wilmington, Illinois (gift).

GUTHRIE, DR. MARY J., Columbia, Missouri: 16 bats—Rocheport, Missouri (gift).

HARRIS, WILLIAM P., Grosse Pointe Park, Michigan: 10 mammals—Various localities (exchange).

HEBBARD, MORGAN, Philadelphia, Pennsylvania: 34 grasshoppers—southwestern United States and Mexico (exchange).

HELLMAYR, DR. AND MRS. C. E., Chicago: 226 insects—Bavaria and Switzerland (gift).

HENDERSON, DR. WILLIAM F., Chicago: 21 butterflies—Selma, Alabama (gift).

HESS, MRS. WILLIAM H., Madison, Wisconsin: 1 weaverbird's nest—India (gift).

HINE, ASHLEY, Chicago: 1 sooty shearwater—California (exchange); 10 bird-lice—Chicago (gift).

HIxon, G. C., Chicago: 2 muskalonge heads—Sayner, Wisconsin (gift).

HOFFMAN, C. VON, New York: 1 ant thrush—Formosa (gift).

HOLMES, MRS. MAUDE, Chicago: 1 introduced green roach—Chicago (gift).

HULL, C. M., Oak Park, Illinois: 15 fly larvae (gift).

JORDAN, DR. KARL, Tring, Herts, England: 50 mammal skins with 49 skulls—Europe and Africa (gift).

KUSCHEL, R., Chicago: 1 ichneumon fly—Chicago (gift).

LAYBOURNE, EDGAR G., Homewood, Illinois: 1 13-lined ground squirrel—Manitowoc, Wisconsin; 2 red-backed salamanders, 2 garter snakes—Michigan and Wisconsin (gift).

LETL, FRANK H., Chicago: 3 ribbon snakes—Sublette, Illinois; 1 Blanding's turtle—Orland Park, Illinois; 1 mole cricket—Palos Park, Illinois (gift).

LEWIS, CHARLES, Elmwood Park, Illinois: 1 house centipede—Illinois (gift).

LINCOLN PARK COMMISSION, Chicago: 1 lion skull (gift).

LIND, G. W., Chicago: 2 camel crickets—Chicago (gift).

LILJEBLAD, EMIL, Chicago: 402 insects—Illinois, Idaho and Washington (gift).

LOWRIE, D. C., Chicago: 345 salamanders—Great Smoky Mountains, Tennessee (gift).

MCGOVERN, DR. WILLIAM M., Evanston, Illinois: 1 monkey without skull, 4 birds—Rio Negro, Brazil (gift).

MOONEY, J. J., Deerfield, Illinois: 8 frogs—Illinois (gift).

MOORE, H. G., Peoria, Illinois: 1 rail skeleton—Tristan da Cunha Island (gift).

MOYER, JOHN, Chicago: 20 insects—Illinois and Wisconsin (gift).

MUSEUM OF COMPARATIVE ZOOLOGY, Cambridge, Massachusetts: 2 coney skins and skulls—Tanganyika Territory (exchange); 7 salamanders, 3 frogs, 6 lizards, 3 snakes, 4 turtles, 1 caiman, 1 African crocodile—Various localities (exchange); 198 sea urchins—Europe and North America (gift).

NECKER, WALTER L., Chicago: 28 salamanders, 4 toads, 2 tree frogs—Sevier County, Tennessee (gift).

NEVILLE, RUSSELL T., Kewanee, Illinois: 2 spotted salamanders—Leasburg, Missouri (gift).

O'BRIEN, WILLIAM, Chicago: 15 ticks—Rainy River, Ontario (gift).

O'CONNOR, ALBERT, Chicago: 1 kingfisher—Chicago (gift).

PARK, DR. ORLANDO, Champaign, Illinois: 13 beetles—Ohio, New Mexico and Washington (gift).

PATTERSON, BRYAN, Chicago: 154 insects—Meadville, Nebraska (gift).

PATTERSON, JAMES, Plainfield, Illinois: 1 swamp tree frog—Will County, Illinois (gift).

PEARSALL, GORDON S., Batavia, Illinois: 1 screech owl—Batavia, Illinois; 1 tiger salamander, 7 snakes, 4 beetles—Michigan (gift).

PLATH, KARL, Chicago: 1 green lizard—Dalmatia, Austria (gift).

PLATT, FREDERICK C., Santiago, Chile: 4 rodent skins and skulls, 16 birds—Santiago, Chile (exchange).

POTTER, F. C., Chicago: 1 leech, 1 dragon fly—Minnesota (gift).

PSOTA, DR. FRANK J., Chicago: 6 damselflies—Mindanao, Philippine Islands; 3 scorpions, 1 mantis—Laredo, Texas (gift).

REED, MRS. C. J., Oak Park, Illinois: 1 yellow-bellied flycatcher—Oak Park, Illinois (gift).

ROMANO, WILLIAM, Chicago: 7 insects—Osage City, Missouri (gift).

SANBORN, COLIN C., Highland Park, Illinois: 18 snakes—Braeside, Illinois; 18 mammals, 4 birds, 1 salamander, 4 frogs, 2 snakes—Missouri (gift).

SASKO, V. S., Chicago: 3 beetles—Sulphur Springs, Utah (gift).

SCHMIDT, F. J. W., Madison, Wisconsin: 1 flying squirrel, 1 prairie mole, 2 fox snakes, 1 painted turtle—Wisconsin (gift).

SCHMIDT, JOHN M., Homewood, Illinois: 9 snakes, 1 soft-shelled turtle—Wisconsin (gift).

SCHMIDT, KARL P., Homewood, Illinois: 1 red-backed salamander, 11 northern skinks—Wisconsin; 1 frog—Porto Rico (gift).

SCHNEIRLA, DR. T. C., New York: 244 ants—North America (exchange).

SENCKENBERG MUSEUM, Frankfort-on-the-Main, Germany: 1 limbless lizard—West Madagascar (exchange).

SETON, MRS. GRACE THOMPSON, Greenwich, Connecticut: 54 bats, 3 tailless whip-scorpions—Philippine Islands (gift).

SHEDD, JOHN G., AQUARIUM, Chicago: 1 Florida manatee—Florida; 9 turtles—White River, Arkansas; 4 electric eels—South America; 1 tree frog, 1 geographic turtle, 1 marine iguana, 72 fishes—Various localities; 15 crustaceans—Arkansas (gift).

SMITH, HOBART M., Manhattan, Kansas: 15 lizards—Oklahoma, Texas and New Mexico (gift).

STEPHEN, JOHN L., Chicago: 1 grasshopper—Florida (gift).

STEVENS, GEORGE M., Marcella, Arkansas: 1 giant snapping turtle—White River, Arkansas (gift).

SVIHLA, DR. ARTHUR, Pullman, Washington: 4 rodent skins and skulls—Whitman County, Washington (exchange).

SWANK, R. C., Chicago: 1 hornet's nest—Saginaw, Missouri (gift).

TODD, J. D., Chicago: 2 spiders, 1 sphinx moth—Chicago (gift).

UNIVERSITY OF OKLAHOMA, Norman, Oklahoma: 1 salamander, 4 toads, 6 frogs, 7 snakes, 11 turtles—Oklahoma and Colorado (exchange).

WALTERS, LEON L., Chicago: 3 snakes—North Dakota; 4 ticks—Komodo Island, Dutch East Indies (gift).

WALTERS, CAPTAIN R. J., Miami, Florida: 2 fishes—Florida (gift).

WASSON, THERON, Chicago: 1 bird-skin—Ecuador (gift).

WEBER, WALTER A., Evanston, Illinois: 10 mammal skins and skulls—Nebraska and Canada (exchange); 2 birds—Babcock, Wisconsin; 1 salamander, 25 frogs and toads, 1 lizard, 5 snakes—Montana and British Columbia (gift).

WEED, ALFRED C., Chicago: 7 snakes—Chicago (gift).

WHITE, CAPTAIN HAROLD A., New York: 33 negatives of antelopes (gift).

WHITSON, T. M., Park Ridge, Illinois: 1 green snake—Illinois (gift).

WINDSOR, A. S., Chicago: 48 salamanders, 2 snakes—Tennessee (gift).

WOLCOTT, A. B., Downers Grove, Illinois: 1 spider, 46 insects—Illinois (gift).

WONDER, FRANK C., Chicago: 1 red bat—Chicago; 3 mammal skulls, 3 mammal skeletons, 15 mammal skins and skulls—North Carolina and Tennessee; 18 salamanders—North Carolina (gift).

WURMBRAND, COUNT DEGENHARD, Vienna, Austria: 1 mounted capercaillie—Austria (gift).

WRIGHT, C. IRVING, Pirates' Cove Fishing Camp, Florida: 1 large tarpon—Florida (gift).

WRIGHT, THURSTON, Birmingham, Alabama: 1 pine warbler—Alabama (gift).

ZINGG, ROBERT M., Chicago: 28 mammal skins and skulls, 26 birds, 3 frogs and toads, 42 lizards, 15 snakes—Chihuahua, Mexico (gift).

RAYMOND FOUNDATION

ATLAS CEMENT COMPANY, Chicago, Illinois: 2 motion picture reels, *From Mountain to Cement Sack* (gift).

FIELD, MRS. MARSHALL, New York: 2,300 feet of 16 mm. film on Africa (gift).

FIELD, HENRY, Chicago, Illinois: 80 Near East stereopticon slides (gift).

FIELD MUSEUM OF NATURAL HISTORY: From Division of Photography: 208 stereopticon slides for extension lectures;

14 negatives for extension lectures; 33 prints for files.

WHITE, CAPTAIN HAROLD A., New York: 2 reels and 2 negatives of African Animals (gift).

DIVISION OF PHOTOGRAPHY

AUCKLAND INSTITUTE AND MUSEUM, Auckland, New Zealand: 9 photographs of Maori types (exchange).

DICKSON, DR. DON F., Lewistown, Illinois: 6 photographs of Dickson Mound burials (gift).

FIELD, HENRY, Chicago: 9 portraits and group pictures of natives—Kish, Irak (gift).

FIELD MUSEUM OF NATURAL HISTORY: Made by Division of Photography: 25,284 prints, 3,210 negatives, 401

stereopticon slides, 244 enlargements and 21 transparent labels.

Developed for expeditions: 207 negatives.

Made by Dr. Paul S. Martin: 100 negatives of Lowry ruin, Colorado.

Made by J. Eric Thompson: 223 negatives of natives and general views in Guatemala and British Honduras.

Purchases: 30 photographs of types of Australian aborigines, from Captain Kilroy Harris; 130 negatives of natives of central and eastern Europe, from the Anthropological Institute, Vienna.

LIBRARY

LIST OF DONORS AND EXCHANGES

(Accessions are by exchange, unless otherwise designated)

FOREIGN INSTITUTIONS

AFRICA

Albany Museum, Grahamstown.
Botanical Survey of South Africa, Pretoria.
Durban Museum, Durban.
East Africa and Uganda Natural History Society, Nairobi.
Exploration Society of Egypt, Cairo.
Geological Society, Johannesburg.
Institut d'Egypte, Cairo.
Ministry of Public Works, Cairo.
Nasionale Museum, Bloemfontein.
Natal Museum, Pietermaritzburg.
Rhodesia Museum, Bulawayo.
Royal Society of South Africa, Cape Town.
Scientific Association of Rhodesia, Bulawayo.
Société d'Histoire Naturelle de l'Afrique du Nord, Algiers.
Société de Géographie d'Alger, Algiers.
Société des Sciences Naturelles du Maroc, Rabat.
South African Botanical Survey, Pretoria.

South African Geological Survey, Johannesburg.

South African Museum, Cape Town.
Station Océanographique, Salammbo.
Transvaal Museum, Pretoria.

University of Stellenbosch, Stellenbosch.

University of Witwatersrand, Johannesburg.

ARGENTINA

Ministerio de Agricultura, Buenos Aires.

Museo de La Plata, La Plata.

Museo Nacional de Historia Natural "Bernardino Rivadavia," Buenos Aires.

Sociedad Argentina de Ciencias Naturales, Buenos Aires.

Sociedad Ornitológica del Plata, Buenos Aires.

Sociedad Physis, Buenos Aires.

Universidad Nacional, Buenos Aires.

Universidad Nacional de Tucumán, Tucumán.

AUSTRALIA

- Australian Museum, Sydney.
 Botanic Garden of Adelaide, Adelaide.
 Botanic Gardens and Government
 Domains, Sydney.
 Commonwealth of Australia, Mel-
 bourne.
 Council for Scientific and Industrial
 Research, Melbourne.
 Department of Agriculture, Adelaide.
 Department of Agriculture, Brisbane.
 Department of Agriculture, Hobart.
 Department of Agriculture, Perth.
 Department of Agriculture, Sydney.
 Department of Agriculture, Welling-
 ton.
 Department of Fisheries, Sydney.
 Department of Mines, Brisbane.
 Department of Mines, Sydney.
 Field Naturalists' Club, Brisbane.
 Field Naturalists' Club, Melbourne.
 Forestry Commission, Sydney (gift).
 Geological Survey, Perth.
 Geological Survey of New South
 Wales, Sydney.
 Great Barrier Reef Committee, Bris-
 bane (gift).
 Linnean Society of New South Wales,
 Sydney.
 Melbourne University, Melbourne.
 Ornithological Society of South Aus-
 tralia, Adelaide.
 Public Library, Museum and Art
 Gallery, Adelaide.
 Public Library, Museum and Art
 Gallery, Melbourne.
 Queensland State Forest Service,
 Brisbane (gift).
 Royal Geographical Society of Aus-
 tralasia, South Australian Branch, Ade-
 laide.
 Royal Society of New South Wales,
 Sydney.
 Royal Society of South Australia,
 Adelaide.
 Royal Society of Tasmania, Hobart.
 Royal Society of Victoria, Melbourne.
 Royal Society of Western Australia,
 Perth.
 Royal Zoological and Acclimatization
 Society, Melbourne.
 Royal Zoological Society of New
 South Wales, Sydney.

South Australian Museum, Adelaide.
 Technological Museum, Sydney.

AUSTRIA

- Akademie der Wissenschaften,
 Vienna.
 Anthropos Administration, Vienna.
 Landesamt für Fremdenverkehr,
 Kärnten.
 Naturhistorisches Museum, Vienna.
 Naturwissenschaftlicher Verein für
 Steiermark, Graz.
 Universität, Vienna.
 Verein der Freunde Asiatischer Kunst
 und Kultur, Vienna.
 Zoologisch-Botanische Gesellschaft,
 Vienna.
 Zoologisches Institut, Graz.

BELGIUM

- Académie Royale des Sciences, Brus-
 sels.
 Direction d'Agriculture, Brussels.
 Institut Botanique Léo Errera, Brus-
 sels.
 Institut des Colonies, Brussels.
 Instituts Solvay, Brussels.
 Jardin Botanique de l'Etat, Brussels.
 Musée du Congo, Brussels.
 Musée Royale d'Histoire Naturelle de
 Belgique, Brussels.
 Musées Royaux du Cinquantenaire,
 Brussels.
 Nederlandsch Phytopathologische
 (Plantenziekten) Verenigen, Ghent.
 Office International pour la Protec-
 tion de la Nature, Brussels.
 Société Belge de Géologie, Brussels.
 Société de Botanique, Brussels.
 Société Ornithologique Belge, Lou-
 vain.
 Société Royale d'Archéologie, Brus-
 sels.
 Société Royale des Sciences, Liège.
 Université de Louvain, Louvain.

BORNEO

Sarawak Museum, Sarawak.

BRAZIL

- Academia Brasileira de Ciencias, Rio
 de Janeiro.
 Biblioteca Nacional, Rio de Janeiro.
 Instituto de Butantun, São Paulo.

Instituto Oswaldo Cruz, Rio de Janeiro.

Museo Nacional, Rio de Janeiro.

Museu Paulista, São Paulo.

Secretaria de Agricultura, Comercio e Obras Publicas, São Paulo.

Serviço Geologico e Mineralogico, Rio de Janeiro.

BRITISH GUIANA

Board of Agriculture, Georgetown.

BRITISH WEST INDIES

Department of Agriculture, Bridgetown, Barbados.

Trinidad and Tobago Department of Agriculture, Port of Spain, Trinidad.

CANADA

Art, Historical and Scientific Association, Vancouver, British Columbia.

Canadian Mining Journal, Gardenvale, Quebec (gift).

Department of Agriculture, Ottawa, Ontario.

Department of Agriculture, Victoria, British Columbia.

Department of Mines, Ottawa, Ontario.

Department of Mines, Toronto, Ontario.

Department of the Interior, Geological Survey, Ottawa, Ontario.

Entomological Society of Ontario, Toronto, Ontario.

McGill University, Montreal, Quebec.

Museum of Zoology, Ottawa, Ontario.

National Museum, Ottawa, Ontario.

Nova Scotian Institute of Natural Sciences, New Brunswick, Nova Scotia.

Provincial Museum, Regina, Saskatchewan.

Provincial Museum, Toronto, Ontario.

Provincial Museum, Victoria, British Columbia.

Royal Canadian Institute, Toronto, Ontario.

Royal Society of Canada, Ottawa, Ontario.

Société de Géographie, Quebec, Quebec.

Université de Montreal, Montreal, Quebec.

Université Laval, Quebec, Quebec.

University of Toronto, Toronto, Ontario.

CENTRAL AMERICA

Museo Nacional, San José, Costa Rica.

CEYLON

Colombo Museum, Colombo.

Department of Agriculture, Colombo.

CHILE

Biblioteca Nacional, Santiago.

Museo Historico Nacional de Chile, Santiago.

Museo Nacional, Santiago.

Revista de Bibliografia, Santiago.

Sociedad de Biologia de Concepción, Concepción.

CHINA

Botanical and Forestry Department, Hong Kong.

Bureau of Entomology of Chekiang Province, Hangchow (gift).

Fan Memorial Institute of Biology, Peiping.

Fukien Christian University, Foochow.

Geological Society, Peiping.

Geological Survey, Peiping.

Geological Survey of Kwangtung and Kwangsi, Canton.

Hong Kong Naturalist, Hong Kong.

Lingnan University, Canton.

Metropolitan Museum of Natural History, Nanking.

Nanking University, Nanking.

National Library, Peiping.

National Research Institute, Shanghai.

Science Society of China, Shanghai.

Society of Natural History, Peiping.

Sun Yatsen University, College of Agriculture, Botanical Institute, Canton.

University of Nanking, Nanking.

Yenching University, Peiping.

COLOMBIA

Ministerio de Industrias, Bogotá.

Sociedad Colombiana de Ciencias Naturales, Bogotá.

CUBA

Academia Nacional de Artes y Letras,
Havana.

CZECHOSLOVAKIA

Académie Tchèque des Sciences,
Prague.

Deutscher Naturwissenschaftlich-
Medizinischer Verein für Böhmen
"Lotos," Prague.

Karlova Universita, Prague.

Narodniho Musea, Prague.

Societas Entomologicae, Warsaw.

Société Royale des Sciences de
Bohême, Prague.

DENMARK

Botaniske Have, Copenhagen.

Danish Expedition to Arctic—Fifth
Thule Expedition, Copenhagen.

Dansk Botanisk Forening, Copen-
hagen.

Dansk Geologisk Forening, Copen-
hagen.

Dansk Naturhistorisk Forening, Co-
penhagen.

Dansk Ornithologisk Forening, Co-
penhagen.

Kommission for Videnskabelige Un-
dersøgelser i Grønland, Copenhagen.

Universitet-Zoologiske Museum,
Copenhagen.

ECUADOR

Academia Nacional de Historia,
Quito.

FEDERATED MALAY STATES

Botanic Gardens, Singapore.

Department of Agriculture, Kuala
Lumpur.

Federated Malay States Museum,
Kuala Lumpur.

Malayan Agricultural Society, Kuala
Lumpur.

Raffles Museum, Singapore.

Royal Asiatic Society, Malayan
Branch, Singapore.

Straits Settlements Botanic Garden,
Singapore.

FIJI ISLANDS

Department of Agriculture, Suva.

FINLAND

Finska Fornminnesföreningen, Hel-
singsfors.

Societas pro Fauna et Flora Fennica,
Helsingfors.

Suomen Museo, Helsingfors.

FRANCE

Académie des Sciences, Paris.

Ecole d'Anthropologie, Paris.

Musée Guimet, Paris.

Musée d'Histoire Naturelle, Mar-
seilles.

Muséum National d'Histoire Natu-
relle, Paris.

Nature, Paris.

Salgues Muséum, Brignolles.

Société Botanique de France, Paris.

Société Dauphinoise d'Ethnologie et
d'Anthropologie, Grenoble.

Société d'Agriculture, Sciences et
Arts, Angers.

Société d'Histoire Naturelle d'Arden-
nes, Ardennes.

Société d'Histoire Naturelle, Tou-
louse.

Société de Géographie, Paris.

Société des Américanistes, Paris.

Société Géologique du Nord, Lille.

Société Linnéenne, Bordeaux.

Société Nationale d'Acclimatation de
France, Paris.

Société Nationale d'Horticulture de
France, Paris.

Société Scientifique du Bourbonnais
et du Centre de France, Moulins.

Société Zoologique de France, Paris.

Université de Montpellier, Montpel-
lier.

GERMANY

Akademie der Wissenschaften, Hei-
delberg.

Akademie der Wissenschaften, Leip-
zig.

Bayerische Akademie der Wissen-
schaften, Munich.

Bayerische Botanische Gesellschaft,
Munich.

Bayerische Ornithologische Gesell-
schaft, Munich.

Botanischer Garten und Botanisches
Museum, Berlin.

Botanischer Verein der Provinz Bran-
denburg, Berlin.

Deutsche Dendrologische Gesell-
schaft, Thyrow.

Deutsche Geologische Gesellschaft,
Berlin.

Deutsche Gesellschaft für Säugetierkunde, Berlin.

Deutsche Morgenländische Gesellschaft, Leipzig.

Deutscher Seefischerei Verein, Berlin.
Friedrich Wilhelms Universität, Berlin.

Geographische Gesellschaft, Munich.
Georg-August-Universität, Göttingen.

Gesellschaft für Erdkunde, Berlin.

Gesellschaft für Erdkunde, Leipzig.

Gesellschaft Naturforschender Freunde, Berlin.

Gesellschaft zur Beförderung der gesamten Naturwissenschaften, Marburg.

Hamburgische Universität, Hamburg.

Hessische Geologische Landesanstalt, Darmstadt.

Hessische Ludwigs Universität, Gießen.

Ibero-Amerikanisches Institut, Berlin.

Museum für Mineralogie, Geologie und Vorgeschichte, Dresden.

Museum für Tierkunde und Völkerkunde, Dresden.

Museum für Völkerkunde, Berlin.

Museum für Völkerkunde, Hamburg.

Naturforschende Gesellschaft, Freiburg.

Naturforschende Gesellschaft, Görlitz.

Naturhistorische Gesellschaft, Hannover.

Naturhistorischer Verein der Preussischen Rheinlande und Westfalens, Bonn.

Naturwissenschaftliche Gesellschaft, Chemnitz.

Naturwissenschaftlicher Verein, Bremen.

Naturwissenschaftlicher Verein, Schleswig-Holstein, Kiel.

Preussische Akademie der Wissenschaften, Berlin.

Preussische Stadtbibliothek, Berlin.

Schlesische Gesellschaft für Vaterland, Breslau.

Senckenbergische Naturforschende Gesellschaft, Frankfurt-on-the-Main.

Universitäts Bibliothek, Berlin.

Universitäts Bibliothek, Hamburg.

Universitäts Bibliothek, Heidelberg.

Universitäts Bibliothek, Marburg.

Universitäts Bibliothek, Tübingen.

Verein für Erdkunde, Leipzig.

Verein für Vaterländische Naturkunde, Württemberg.

Verein für Volkskunde, Berlin.

Verwaltung der Staat Sammlungen für Kunst und Wissenschaft, Dresden.

Zoologisches Museum, Berlin.

Zoologisches Museum, Hamburg.

GREAT BRITAIN

Agricultural Experiment Station, Newcastle-upon-Tyne.

Ashmolean Museum, Oxford.

Ashmolean Natural History Society, Oxford.

Birmingham Natural History and Philosophical Society, Birmingham.

Brighton and Hove Natural History and Philosophical Society, Brighton.

Bristol Museum, Bristol.

British Library of Political Science, London.

British Museum, London.

British Museum (Natural History), London.

Cambridge Antiquarian Society, Cambridge.

Cambridge Philosophical Society, Cambridge.

Cambridge University, Cambridge.

Dove Marine Laboratory, Cullercoats.

Fisheries Board, Edinburgh.

Geological Society, Liverpool.

Geological Survey of England and Wales, London.

Geological Survey of Scotland, Edinburgh.

Geologists' Association, London.

Hull Museum, Hull.

Japan Society of London, London.

Lancashire Sea Fisheries Laboratory, Liverpool.

Leicester Museum, Art Gallery and Library, Leicester.

Linnean Society, London.

Liverpool Biological Society, Liverpool.

Manchester Literary and Philosophical Society, Manchester.

Manchester Museum, Manchester.

Marine Biological Association, Plymouth.

Marine Biological Station, Liverpool.

National Indian Association, London.
National Library of Wales, Aberystwyth.

National Museum of Wales, Cardiff.
Natural History Society, Glasgow.
Natural History Society of Northumberland, Durham and Newcastle-on-Tyne, Newcastle-upon-Tyne.

Naturalists' Society, Cardiff.
Oriental Ceramic Society, London (gift).

Prehistoric Society of East Anglia, Ipswich.

Royal Anthropological Institute of Great Britain and Ireland, London.

Royal Asiatic Society of Great Britain and Ireland, London.

Royal Botanic Garden, Edinburgh.
Royal Botanic Gardens, Kew.

Royal Colonial Institute, London.

Royal Geographical Society, London.

Royal Horticultural Society, London.

Royal Society, London.

Royal Society of Arts, London.

Royal Society of Edinburgh, Edinburgh.

School of Oriental Studies, London.

Society of Antiquaries, Edinburgh.

Society of Antiquaries, London.

South London Entomological and Natural History Society, London.

Southeastern Agricultural College, Wye.

Speleological Society, Bristol.

Tring Zoological Museum, Tring.

Victoria and Albert Museum, London.

Wellcome Research Laboratories, London.

Zoological Society, London.

GUATEMALA

Sociedad de Geografía e Historia, Guatemala.

HUNGARY

Magyar Természettudományi Társulat, Budapest.

Musée National e Hongrois, Budapest.

INDIA

Anthropological Society, Bombay.

Archaeological Department, Hyderabad.

Archaeological Survey, Calcutta.

Asiatic Society of Bengal, Calcutta.
Bihar and Orissa Research Society, Patna.

Botanical Survey, Calcutta.

Department of Agriculture, Bombay.

Department of Agriculture, Madras.

Geological, Mining and Metallurgical Society of India, Calcutta.

Geological Survey, Calcutta.

Government Museum, Madras.

Imperial Institute of Agriculture, Pusa.

Indian Botanical Society, Calcutta.

Indian Museum, Calcutta.

Mining and Geological Institute of India, Calcutta.

Prince of Wales Museum of West India, Bombay.

Ryōjun College of Engineering, Ryōjun.

University of Calcutta, Calcutta.

Zoological Survey of India, Calcutta.

IRELAND

Belfast Natural History and Philosophical Society, Belfast.

Belfast Naturalists' Field Club, Belfast.

National Museum, Dublin.

Queen's University, Department of Botany, Belfast (gift).

Royal Irish Academy, Dublin.

Royal Society, Dublin.

Trinity College Library, Dublin.

University of Dublin, Dublin.

ITALY

Museo Civico di Storia Naturale, Genoa.

R. Accademia delle Scienze, Naples.

R. Accademia delle Scienze, Turin.

R. Accademia d'Italia, Rome.

R. Accademia Nazionale del Lincei, Rome.

R. Orto Botanico Giardino Coloniale, Palermo.

R. Scuola Superiore di Agricoltura, Portici.

R. Società Geografica Italiana, Rome.

Società Botanica Italiana, Florence.

Società dei Naturalisti, Naples.

Società Italiana d'Antropologia e Etnologia, Florence.

Società Italiana di Scienze Naturali,
Milan.

Società Reale di Napoli, Naples.

Società Romana d'Antropologia,
Rome.

Società Toscana di Scienze Naturali,
Pisa.

Università, Genoa.

Università di Napoli, Museo Zoologico,
Naples.

JAPAN

Biogeographical Society, Tokyo.

Department of Agriculture of Formosa,
Taihoku.

Deutsche Gesellschaft für Natur- und
Völkerkunde Ostasiens, Tokyo.

Government Research Institute, Taihoku,
Formosa.

Hiroshima University, Hiroshima
(gift).

Hokkaido Imperial University, Sapporo.

Imperial Academy of Tokyo, Tokyo.

Imperial Agricultural Experiment
Station, Nishigaha, Tokyo (gift).

Imperial Geological Society, Tokyo.

Imperial Geological Survey, Tokyo.

Imperial Household Museums, Tokyo.

Imperial University, Kyoto.

Imperial University, Tokyo.

Kyushu University, Fukuoka (gift).

Miyazaki Imperial College of Agriculture
and Forestry, Miyazaki.

Museum Work Promotion Association,
Tokyo.

National Research Council, Tokyo.

Ornithological Society, Tokyo.

Tohoku Imperial University, Sendai.

Tokyo Botanical Society, Tokyo.

Tottori Agricultural College, Tottori.

JAVA

Bataviaasch Genootschap en Rechtshoogeschool, Weltevreden.

Bataviaasch Genootschap van Kunsten
en Wetenschappen, Batavia.

Department of Agriculture, Buitenzorg.

Jardin Botanique, Weltevreden.

Java Institute, Weltevreden.

K. Natuurkundige Vereeniging in
Nederlandsch-Indie, Weltevreden.

MEXICO

Instituto de Biología, Mexico.

Instituto Geológico de Mexico, Mexico.

Museo Nacional de Arqueología, Historia
y Etnología, Mexico.

Secretaria de Educacion Publica,
Mexico.

Sociedad Cientifica "Antonio Alzate,"
Mexico.

Sociedad Cooperativa Limitada Pro-
cultura Regional, Mazatlan (gift).

Sociedad de Antropología y Etnología,
Mexico.

Sociedad de Geografía y Estadística,
Mexico.

Sociedad Forestal de Mexico, Mexico.

NETHERLANDS

Koloniaal Instituut, Amsterdam.

K. Instituut voor de Taal-Land-
en Volkenkunde van Nederlandsch Indie,
The Hague.

K. Nederlandsch Aardrijkundig Genootschap,
Amsterdam.

Landbouwhoogerschool, Wageningen.

Nederlandsch Vogelkundigen Club,
Leiden.

Nederlandsche Dierkunde Vereeniging,
Helder.

Nederlandsche Ornithologische Vereeniging,
Utrecht.

Nederlandsche Plantenziektenkundige
Vereeniging, Wageningen.

Rijks Ethnographisch Museum, Leiden.

Rijks Geologisch-Mineralogisch Museum,
Leiden.

Rijks Herbarium, Leiden.

Rijks Museum van Natuurlijke Historie,
Leiden.

Rijks Universiteit, Leiden.

NEW ZEALAND

Auckland Institute and Museum,
Wellington.

Canterbury Museum, Christchurch.

Cawthron Institute, Nelson.

Department of Agriculture, Wellington.

Department of Mines, Geological
Survey, Wellington.

New Zealand Institute, Wellington.

Otago Museum, Dunedin.

Wanganui Public Museum, Wanganui.

NORWAY

Bergen Museum, Bergen.

Norges Geologiske Undersøkelse, Oslo.

Norges Svalbard og Ishavs Undersøkelse, Oslo.

Norsk Geologisk Forening, Oslo.

Norsk Ornithologisk Forening, Oslo.

Norske Geografiske Selskab, Oslo.

Norske Videnskapsakademi, Oslo.

Nyt Magazin for Naturvidenskaberne, Oslo.

Tromsø Museum, Tromsø.

Zoologiske Museum, Oslo.

PALESTINE

Institute of Agriculture and Natural History, Tel-Aviv.

Institutum Historiae Naturalis, Jerusalem.

Jewish National and University Library, Jerusalem.

PANAMA

Canal Zone Plant Introduction Gardens, Panama (gift).

PERU

Archivo Nacional, Lima.

Instituto Historico, Lima.

Sociedad Geológica del Peru, Lima.

Universidad, Cuzco.

POLAND

Académie Polonaise des Sciences et des Arts, Cracow.

Musei Polonici Historiae Naturali, Warsaw.

Musei Zoologici Polonici, Warsaw.

Panstwowego Muzeum Archeologicznego, Warsaw.

Société Botanique de Pologne, Warsaw.

Uniwersytet Poznanski, Posen.

Uniwersytet Warszawski, Warsaw.

PORTUGAL

Academia das Ciencias, Lisbon.

Instituto Superior de Comércio, Lisbon (gift).

Société Portugaise des Sciences Naturelles, Lisbon.

Universidade de Coimbra, Museu Zoologico, Coimbra.

ROUMANIA

Jardin et Musée Botaniques, Cluj.

Université de Jassy, Jassy.

SPAIN

Junta para Amplicación de Estudios e Investigaciones Cientificas, Madrid.

R. Academia de Ciencias, Madrid.

Sociedad Española de Antropologia, Etnografia y Prehistoria, Madrid.

Sociedad Española de Historia Natural, Madrid.

SWEDEN

Generalstabens Litografiska Anstalt, Stockholm.

Göteborgs Botaniska Trädgrad, Göteborg.

Göteborgs Museum, Göteborg.

K. Biblioteket, Stockholm.

K. Svenska Vetenskapsakademien, Stockholm.

K. Universitet, Upsala.

K. Vetenskaps- och Vitterhets-Samhälle, Göteborg.

K. Vitterhets-, Historie- och Antikvitetsakademien, Stockholm.

Svenska Sellskapet for Antropologi och Geografi, Stockholm.

SWITZERLAND

Botanisches Museum, Zürich.

Geographisch-Ethnographische Gesellschaft, Zürich.

Kantonale Universität, Bern.

Naturforschende Gesellschaft, Basel.

Naturforschende Gesellschaft, Zürich.

Naturhistorisches Museum, Basel.

Schweizerische Entomologische Gesellschaft, Bern.

Schweizerische Gesellschaft für Volkskunde, Basel.

Société de Physique et d'Histoire Naturelle, Geneva.

Société Fribourgeoise des Sciences Naturelles, Fribourg.

Société Helvétique des Sciences Naturelles, St. Gall.

Société Neuchateloise de Géographie, Neuchatel.

Société Zoologique, Geneva.

UNION OF SOCIALISTIC SOVIET REPUBLICS

Abhasian Scientific Society, Suchum.
Académie des Sciences, Leningrad.
Botanical Garden, Leningrad.
Eesti Rahva Museum, Tartu.
Institut des Recherches, Voronez.
Institute for Plant Protection, Leningrad.
Institute of Applied Mineralogy and Petrography, Moscow.
Société des Naturalistes, Leningrad.

Société Russe de Géographie, Leningrad.

Université de l'Asie Centrale, Tashkent.

URUGUAY

Instituto de Geologia y Perferaciones, Montevideo.

Jardin Botánico, Montevideo (gift).

VENEZUELA

Cultura Venezolana, Caracas.

DOMESTIC INSTITUTIONS

ARIZONA

Arizona Museum, Phoenix.
Arizona University, Tucson.

ARKANSAS

State Geological Survey, Little Rock (gift).

CALIFORNIA

Balboa Park Museum, San Diego.
California Academy of Sciences, San Francisco.

Cooper Ornithological Club, Hollywood.

County Free Library, Los Angeles.
Department of Agriculture, Sacramento (gift).

Fish and Game Commission, Sacramento.

Henry E. Huntington Library and Art Gallery, San Marino (gift).

Natural History Museum, San Diego.
Pomona College, Claremont.

Riverside Public Library, Riverside (gift).

San Diego Zoological Society, San Diego.

Santa Barbara Museum, Santa Barbara.

Scripps Institution of Biological Research, La Jolla.

Society of Natural History, San Diego.

Southern California Academy of Sciences, Los Angeles.

Southwest Museum, Los Angeles.

Stanford University, Stanford.

State Mining Bureau, Sacramento.

University of California, Berkeley.

University of Southern California, Los Angeles.

COLORADO

Agricultural Experiment Station, Fort Collins.

Bureau of Mines, Denver.

Colorado College, Colorado Springs.

Colorado Scientific Society, Denver.

Denver Art Museum, Denver (gift).

Museum of Natural History, Denver.

CONNECTICUT

Agricultural Experiment Station, New Haven.

American Oriental Society, New Haven.

Children's Museum, Hartford (gift).

Connecticut Academy of Arts and Sciences, New Haven.

Hartford Public Library, Hartford.

Osborn Botanical Laboratory, New Haven.

State Board of Fisheries and Game, Hartford.

State Geological and Natural History Survey, Hartford.

Yale University, New Haven.

FLORIDA

State Geological Survey, Tallahassee.

University of Florida, Gainesville.

GEORGIA

Geological Survey, Atlanta.

HAWAII

Agricultural Experiment Station, Honolulu.

Bernice Pauahi Bishop Museum,
Honolulu.

Board of Commissioners, Honolulu.
Hawaiian Entomological Society,
Honolulu (gift).

Hawaiian Historical Society, Honolulu.

Hawaiian Sugar Planters' Association
Experiment Station, Honolulu.

Hawaiian Volcano Observatory,
Honolulu.

University of Hawaii, Honolulu.

IDAHO

Inspector of Mines, Boise.

State Historical Society, Boise.

University of Idaho, Moscow.

ILLINOIS

Agricultural Experiment Station, Urbana.

Armour Institute, Chicago.

Art Institute of Chicago, Chicago.

Avicultural Society of America, Chicago.

Board of Education, Chicago.

Chicago Academy of Sciences, Chicago.

Chicago Association of Commerce,
Chicago (gift).

Chicago Public Library, Chicago.

Chicago Zoological Society, Brookfield (gift).

General Biological Supply House,
Chicago (gift).

Hardwood Record, Chicago (gift).

Illinois Bell Telephone Company,
Chicago (gift).

Inland Printer, Chicago (gift).

Izaak Walton League of America,
Chicago (gift).

John Crerar Library, Chicago.

Lewis Institute, Chicago.

Morton Arboretum, Lisle.

Museum of Science and Industry,
Chicago.

National College of Education,
Evanston (gift).

Newberry Library, Chicago.

Northwestern University, Evanston.

Open Court Publishing Company,
Chicago.

State Geological Survey, Springfield.

State Historical Library, Springfield.

State Water Survey, Urbana.

Union League Club, Chicago (gift).

University of Chicago, Chicago.

University of Illinois, Urbana.

Wesleyan University, Bloomington.

INDIANA

Academy of Sciences, Indianapolis.

Butler University, Indianapolis.

Indiana Department of Conservation,
Indianapolis.

Indiana University, Bloomington.

John Herron Art Institute, Indianapolis.

Purdue University, Lafayette.

University of Notre Dame, Notre Dame.

IOWA

Historical, Memorial and Art Department,
Des Moines.

Iowa Academy of Science, Des Moines.

Iowa Horticultural Society, Des Moines.

University of Iowa, Iowa City.

KANSAS

Academy of Science, Topeka.

Agricultural Experiment Station,
Manhattan (gift).

State Board of Agriculture, Lawrence.

State Historical Society, Topeka.

University of Kansas, Lawrence.

KENTUCKY

Williams Natural History Society,
Covington.

LOUISIANA

Department of Conservation, Baton Rouge.

Howard Memorial Library, New Orleans.

Louisiana State University, Baton Rouge (gift).

Tulane University, New Orleans.

MAINE

Agricultural Experiment Station,
Orono.

Bowdoin College, Brunswick.

MARYLAND

Johns Hopkins University, Baltimore.

Maryland Institute, Baltimore.

MASSACHUSETTS

Agricultural Experiment Station,
Amherst.

American Academy of Arts and
Sciences, Boston.

American Antiquarian Society,
Worcester.

Boston Public Library, Boston.

Boston Society of Natural History,
Boston.

Children's Museum, Boston (gift).

Clark University, Worcester.

Essex Institute, Salem.

Harvard College, Museum of Com-
parative Zoology, Cambridge.

Harvard University, Arnold Arbore-
tum, Jamaica Plain.

Harvard University, Gray Herba-
rium, Cambridge.

Horticultural Society, Boston.

Marine Biological Laboratory,
Wood's Hole.

Museum of Fine Arts, Boston.

New Bedford Public Library, New
Bedford.

Peabody Museum, Cambridge.

Springfield City Library Association,
Springfield.

Williams College, Williamstown.

Worcester County Horticultural
Society, Worcester.

MICHIGAN

Academy of Science, Arts and Letters,
Ann Arbor.

Agricultural Experiment Station,
Agricultural College.

College of Mines, Houghton.

Cranbrook Institute of Science,
Bloomfield Hills (gift).

Detroit Institute of Art, Detroit.

Edward K. Warren Foundation,
Three Oaks.

Grand Rapids Public Library, Grand
Rapids.

Michigan State Library, Lansing.

State Board of Agriculture, Lansing.

State Board of Library Commission,
Lansing.

University of Michigan, Ann Arbor.

MINNESOTA

Agricultural Experiment Station,
University Farm.

Minneapolis Institute of Arts, Minne-
apolis.

Minnesota Historical Society, St.
Paul.

University of Minnesota, St. Paul.

MISSISSIPPI

Agricultural Experiment Station,
Agricultural College.

Mississippi Plant Board, Agricultural
College.

State Geological Survey, Jackson
(gift).

MISSOURI

Agricultural Experiment Station,
Columbia.

City Art Museum, St. Louis.

Missouri Botanical Garden, St. Louis.

Missouri Historical Society, Colum-
bia.

St. Louis Public Library, St. Louis.

St. Louis University, St. Louis.

University of Missouri, Columbia.

Washington University, St. Louis.

MONTANA

State Bureau of Mines and Geology,
Butte (gift).

State University, Missoula.

NEBRASKA

Omaha Public Library, Omaha.

State University, Lincoln.

NEVADA

Nevada University, Agricultural Ex-
periment Station, Carson City.

NEW JERSEY

Agricultural Experiment Station,
Trenton.

Drew University, Madison (gift).

Newark Museums Association, New-
ark.

Newark Public Library, Newark.

Princeton University, Princeton.

NEW MEXICO

Agricultural Experiment Station,
Santa Fe.

American School of Prehistoric Re-
search, Santa Fe.

Historical Society, Santa Fe.

New Mexico Museum, Santa Fe.

NEW YORK

Agricultural Experiment Station, Geneva.

American Academy of Rome, New York.

American Geographical Society, New York.

American Museum of Natural History, New York.

American Polish Chamber of Commerce, New York (gift).

Amtorg Trading Corporation, New York (gift).

Bingham Oceanographic Collection, New York (gift).

Brooklyn Botanic Garden, Brooklyn.

Brooklyn Institute of Arts and Sciences, Brooklyn.

Buffalo Society of Natural Sciences, Buffalo.

Carnegie Corporation of New York (gift).

Colgate and Company, New York (gift).

College Art Association, New York (gift).

Columbia University, New York.

Cornell University, Ithaca.

Drug Markets, New York (gift).

Eastman Kodak Company, Rochester (gift).

Garden Club of America, New York (gift).

General Society of Mechanics and Tradesmen, New York (gift).

Institute of International Education, New York (gift).

Japan Society, New York.

Metropolitan Museum of Art, New York.

Municipal Museum, Rochester.

New York Botanical Garden, New York.

New York Historical Society, New York.

New York State Library, Albany.

New York University, New York.

Oil and Fat Industries, New York (gift).

Pratt Institute, New York.

Public Library, Brooklyn.

Public Library, New York.

Rochester Academy of Science, Rochester.

Roerich Museum—Himalayan Research Institute, New York.

Soap, New York (gift).

South Manchuria Railway Company, New York (gift).

Spice Mill, New York (gift).

State College of Forestry, Syracuse.

State Museum, Albany.

Staten Island Institute of Arts and Sciences, New York.

Stone Publishing Company, New York (gift).

Syracuse University, Syracuse.

Taylor Instrument Companies, Rochester (gift).

Tompkins-Kiel Marble Company, New York (gift).

Union College, Schenectady (gift).

United Fruit Company, New York (gift).

Vassar College, Poughkeepsie.

Yonkers Museum of Science and Art, Yonkers (gift).

Zoological Society, New York.

NORTH CAROLINA

Department of Agriculture, Raleigh.

Department of Conservation and Industry, Raleigh (gift).

Duke University, Durham.

Elisha Mitchell Scientific Society, Chapel Hill.

NORTH DAKOTA

State Historical Society, Bismarck.

OHIO

Agricultural Experiment Station, Wooster.

American Chemical Society, Columbus.

Cincinnati Museums Association, Cincinnati.

Cincinnati Public Library, Cincinnati.

Cleveland Museum of Art, Cleveland.

Cleveland Museum of Natural History, Cleveland.

Cleveland Public Library, Cleveland.

Denison University, Granville.

General Electric Company, Cleveland (gift).

Geological Survey, Columbus (gift).

Junior Society of Natural Sciences, Cincinnati (gift).

Lloyd Library, Cincinnati.

Oberlin College, Oberlin.

Ohio Archaeological and Historical Society, Columbus.

Ohio State Museum, Columbus.

Ohio State University, Columbus.

Proctor and Gamble Company, Cincinnati (gift).

University of Cincinnati, Cincinnati.

Western Reserve University, Cleveland (gift).

Wilson Ornithological Club, Oberlin.

OKLAHOMA

Oklahoma Academy of Sciences, Norman.

Oklahoma Geological Survey, Norman.

Oklahoma Historical Society, Oklahoma City (gift).

University of Oklahoma, Norman.

OREGON

Agricultural Experiment Station, Corvallis.

University of Oregon, Eugene.

PENNSYLVANIA

Academy of Natural Sciences, Philadelphia.

Agricultural Experiment Station, Harrisburg.

American Philosophical Society, Philadelphia.

Antivenin Institute of America, Philadelphia.

Carnegie Institute, Pittsburgh.

Commercial Museum, Philadelphia.

Department of Agriculture, Harrisburg.

Department of Forests and Waters, Harrisburg.

Dropsie College, Philadelphia.

Engineers' Society of Western Pennsylvania, Pittsburgh.

Erie Public Museum, Erie.

Franklin Institute, Philadelphia.

Lehigh University, South Bethlehem.

Library Company of Philadelphia, Philadelphia.

Pennsylvania Museum and School of Industrial Art, Philadelphia.

Philadelphia College of Pharmacy, Philadelphia.

Sullivant Moss Society, Pittsburgh.

Topographical and Geological Survey, Harrisburg (gift).

University of Pennsylvania, Philadelphia.

University of Pennsylvania, Museum, Philadelphia.

Wagner Free Institute of Science, Philadelphia.

Wyoming Historical and Geological Society, Wilkes-Barre.

PHILIPPINE ISLANDS

Bureau of Education, Manila.

Bureau of Science, Manila.

Department of Agriculture and Natural Resources, Manila.

PORTO RICO

Agricultural Experiment Station, Rio Piedras.

Department of Agriculture of Porto Rico, San Juan.

RHODE ISLAND

Roger Williams Park Museum, Providence.

SOUTH CAROLINA

Charleston Museum, Charleston.

SOUTH DAKOTA

Black Hills Engineer, Rapid City (gift).

TENNESSEE

Agricultural Experiment Station, Nashville.

Geological Survey, Nashville.

Tennessee Academy of Science, Nashville.

TEXAS

Agricultural Experiment Station, College Station.

Baylor University, Waco.

Houston Museum and Scientific Society, Houston.

Museum Association, San Antonio (gift).

University of Texas, Austin.

UTAH

Agricultural Experiment Station, Logan.

VERMONT

Agricultural Experiment Station,
Burlington.

VIRGINIA

State Library, Richmond.
Virginia Geological Survey, Char-
lottesville.

WASHINGTON (State of):

Mountaineer Club, Seattle.
Puget Sound Biological Station,
Seattle.
Washington State College, Pullman.
Washington University, Seattle.
Washington University, Historical
Society, Seattle.

WASHINGTON, D.C.

American Association for the Ad-
vancement of Science.
American Association of Museums.
American Mining Congress.
Carnegie Institution of Washington
(gift).
Catholic Anthropological Conference.
Legacion de Guatemala.
Library of Congress.
National Academy of Science.

National Geographic Society (gift).
National Parks Bulletin.
National Research Council.
Pan-American Union.
Science Service.
Smithsonian Institution.
Tropical Plant Research Foundation.
United States Government.
United States National Museum.

WEST VIRGINIA

State Department of Agriculture,
Charleston.
West Virginia University, Morgan-
town.

WISCONSIN

Agricultural Experiment Station,
Madison.
Beloit College, Beloit.
Logan Museum, Beloit.
Public Museum of Milwaukee, Mil-
waukee.
State Horticultural Society, Madison.
University of Wisconsin, Madison.
Wisconsin Academy of Arts, Sciences
and Letters, Madison.
Wisconsin Archaeological Society,
Madison.

INDIVIDUALS

(Accessions are by gift unless otherwise designated)

Ackert, James E., Manhattan, Kan-
sas.

Adams, Charles C., Albany, New
York (exchange).

Allen, Glover M., Cambridge, Massa-
chusetts (exchange).

Ames, Oakes, Cambridge, Massachu-
setts.

Arthur, J. C., Lafayette, Indiana
(exchange).

Baerg, W. J., Fayetteville, Arkansas.

Barnes, R. Magoon, Lacon, Illinois.

Baschmakoff, Alexandre, Paris,
France.

Beaux, Oscar de, Geneva, Switzer-
land (exchange).

Blanchard, Frank N., Ann Arbor,
Michigan (exchange).

Brandstetter, Renward, Lucerne,
Switzerland (exchange).

Browning, William, Brooklyn, New
York.

Bychowska, Marta, Warsaw, Poland.
Carpenter, E. M., Cambridge, Massa-
chusetts.

Castellanos, Alfredo, Buenos Aires,
Argentina.

Cockerell, T. D. A., Boulder, Colorado
(exchange).

Collinge, Walter E., York, England
(exchange).

Colón, E. D., San Juan, Porto Rico.

Colyer, Sir Frank, London, England.

Cook, Harold J., Agate, Colorado.

Cook, Melville T., Rio Piedra, Porto
Rico (exchange).

Coolidge, Harold J., Jr., Cambridge,
Massachusetts.

Cornell, Margaret, Chicago.

Darlington, Henry Townsend, Lan-
sing, Michigan.

- De Sushko, Alexander, Chicago.
Domin, Karel, Prague, Czechoslovakia (exchange).
Du Mont, Philip A., Des Moines, Iowa.
Eggleton, Frank E., Ann Arbor, Michigan.
Farwell, Oliver A., Detroit, Michigan.
Fernald, M. L., Cambridge, Massachusetts (exchange).
Field, Henry, Chicago.
Field, Stanley, Chicago.
Fontana, Mario A., Montevideo, Uruguay.
Friedlander and Son, Berlin, Germany.
Fryxell, Fritiof M., Moline, Illinois.
Gainey, P. L., St. Louis, Missouri.
Garay, N., Panama.
Gates, Frank C., Manhattan, Kansas.
Gee, N. Gist, Shanghai, China (exchange).
Geiser, S. W., Dallas, Texas.
Gerhard, William J., Chicago.
Goldman, E. A., Washington, D.C. (exchange).
Gordon, Myron, Ithaca, New York.
Gregg, Clifford C., Park Ridge, Illinois.
Gregory, William K., New York (exchange).
Grinnell, Joseph, Berkeley, California (exchange).
Gusinde, Martin, Vienna, Austria.
Haenisch, Erich, Leipzig, Germany.
Hawley, Florence M., Tucson, Arizona.
Heck, Lutz, Berlin, Germany (exchange).
Hendry, G. W., Berkeley, California.
Hicken, C. M., Buenos Aires, Argentina (exchange).
Hickman, Jennings R., Ann Arbor, Michigan.
Hubbs, Carl L., Ann Arbor, Michigan (exchange).
Hurley, Jorge, Belém-Pará, Brazil (exchange).
Jijon y Caamano, J., Quito, Ecuador.
Judd, Neil M., Washington, D.C. (exchange).
Kelley, Harper, Paris, France.
Kempf, E. J., Wading River, New York.
Kidder, Alfred Vincent, Andover, Massachusetts.
Knowlton, Clarence Hinckley, Boston, Massachusetts.
Kosaka, Hiroshi, Fukuoka, Japan.
Kraft, C. F., Washington, D.C.
Krajewski, Franciszek, Warsaw, Poland.
Krenner, Josef, Budapest, Hungary.
Kurvabara, Yojiro, Matsue, Japan.
Langdon, Stephen, Oxford, England.
Laufer, Berthold, Chicago.
Lehmann, E., Giessen, Germany.
Leon, Hermano, Havana, Cuba.
Leung, George Kin, Shanghai, China.
Lévy-Bruhl, Lucien, Paris, France (exchange).
Lewis, A. B., Chicago.
Lindblom, K. G., Stockholm.
Lindsey, Arthur W., Granville, Ohio.
Lönnerberg, Einar, Stockholm, Sweden (exchange).
Loo, C. T., Chicago.
Looser, G., Santiago, Chile.
Lowe, Charles W., Ottawa, Canada.
Lowe, Percy, London, England (exchange).
McIntosh, Arthur C., Rapid City, South Dakota.
McNair, James B., Chicago.
Maisch, Karl, Lima, Peru.
Meek, Alexander, Durham, England.
Mertens, Robert, Frankfurt-on-the-Main, Germany.
Meylan, O., Geneva, Switzerland.
Moir, J. Reid, Ipswich, England.
Moorehead, Warren, Andover, Massachusetts (exchange).
Mori, Kinjiro, Tokyo, Japan.
Müller, Lorenz, Munich, Germany (exchange).
Neugebauer, Kazimierz, Warsaw, Poland.
Neumayer,—, Vienna, Austria.
Noguera, Eduardo, Mexico, Mexico.
Olson, Ronald L., New York.
Osborn, Henry Fairfield, New York (exchange).
Osgood, Wilfred H., Chicago.
Outes, Felix F., Buenos Aires, Argentina.
Peters, James L., Cambridge, Massachusetts (exchange).

Pittier, Henry, Caracas, Venezuela (exchange).

Poole, Earl L., Reading, Pennsylvania.

Potta, Frank J., Chicago.

Rawleigh, W. T., Freeport, Illinois.

Robinson, Benjamin L., Cambridge, Massachusetts (exchange).

Rösch, Siegfried, Leipzig, Germany (exchange).

Sanborn, Colin C., Highland Park, Illinois.

Sarkar, Benoy Kumar, Calcutta, India.

Satterthwaite, A. F., Washington, D.C.

Scheumann, K. H., Leipzig, Germany.

Schmidt, Johannes, Copenhagen, Denmark.

Schmidt, Karl P., Chicago.

Schneirla, T. C., New York.

Schoute, J. C., Groningen, Holland.

Schüz, Ernst, Dresden, Germany.

Sheldon, J. M. Arms, Deerfield, Massachusetts.

Shelford, Victor E., Champaign, Illinois (exchange).

Sherff, Earl E., Chicago.

Shoemaker, Henry W., Altoona, Pennsylvania.

Silverman, Alexander, Pittsburgh, Pennsylvania.

Simms, Stephen C., Chicago.

Snelleman, J. F., The Hague, Holland.

Spencer, L. J., London, England (exchange).

Standley, Paul C., Chicago.

Starr, Frederick, Seattle, Washington (exchange).

Stearns, Harold T., Honolulu, Hawaii.

Stefanski, Elizabeth, Chicago.

Sternberg, C. M., Hays, Kansas.

Strand, Embrik, Riga, U.S.S.R.

Sunamoto Shoten, F., Osaka, Japan.

Svihla, Arthur, Pullman, Washington.

Svihla, Ruth, Pullman, Washington.

Taylor, Griffith, Chicago.

Thompson, J. Eric, Chicago.

Townsend, M. T., Bloomington, Illinois.

Underdown, C. E., Chicago.

Van den Brink, F. H., Utrecht, Holland.

Walker, James W., Chicago.

Zaborski, Bogdan, Cracow, Poland.

Zimanyi, Karl, Budapest, Hungary (exchange).

ARTICLES OF INCORPORATION

STATE OF ILLINOIS

DEPARTMENT OF STATE

WILLIAM H. HINRICHSSEN, *Secretary of State*

TO ALL TO WHOM THESE PRESENTS SHALL COME, GREETING:

Whereas, a Certificate duly signed and acknowledged having been filed in the office of the Secretary of State, on the 16th day of September, A.D. 1893, for the organization of the COLUMBIAN MUSEUM OF CHICAGO, under and in accordance with the provisions of "An Act Concerning Corporations," approved April 18, 1872, and in force July 1, 1872, and all acts amendatory thereof, a copy of which certificate is hereto attached.

Now, therefore, I, William H. Hinrichsen, Secretary of State of the State of Illinois, by virtue of the powers and duties vested in me by law, do hereby certify that the said COLUMBIAN MUSEUM OF CHICAGO is a legally organized Corporation under the laws of this State.

In Testimony Whereof, I hereto set my hand and cause to be affixed the Great Seal of State. Done at the City of Springfield, this 16th day of September, in the year of our Lord one thousand eight hundred and ninety-three, and of the Independence of the United States the one hundred and eighteenth.

W. H. HINRICHSSEN,

Secretary of State.

[SEAL]

TO HON. WILLIAM H. HINRICHSSEN,

SECRETARY OF STATE:

SIR:

We, the undersigned citizens of the United States, propose to form a corporation under an act of the General Assembly of the State of Illinois, entitled "An Act Concerning Corporations," approved April 18, 1872, and all acts amendatory thereof; and that for the purposes of such organization we hereby state as follows, to-wit:

1. The name of such corporation is the "COLUMBIAN MUSEUM OF CHICAGO."

2. The object for which it is formed is for the accumulation and dissemination of knowledge, and the preservation and exhibition of objects illustrating Art, Archaeology, Science and History.

3. The management of the aforesaid museum shall be vested in a Board of FIFTEEN (15) TRUSTEES, five of whom are to be elected every year.

4. The following named persons are hereby selected as the Trustees for the first year of its corporate existence:

Edward E. Ayer, Charles B. Farwell, George E. Adams, George R. Davis, Charles L. Hutchinson, Daniel H. Burnham, John A. Roche, M. C. Bullock, Emil G. Hirsch, James W. Ellsworth, Allison V. Armour, O. F. Aldis, Edwin Walker, John C. Black and Frank W. Gunsaulus.

5. The location of the Museum is in the City of Chicago, County of Cook, and State of Illinois.

(Signed)

George E. Adams, C. B. Farwell, Sidney C. Eastman, F. W. Putnam, Robert McCurdy, Andrew Peterson, L. J. Gage, Charles L. Hutchinson, Ebenezer Buckingham, Andrew McNally, Edward E. Ayer, John M. Clark, Herman H. Kohlsaat, George Schneider, Henry H. Getty, William R. Harper, Franklin H.

Head, E. G. Keith, J. Irving Pearce, Azel F. Hatch, Henry Wade Rogers, Thomas B. Bryan, L. Z. Leiter, A. C. Bartlett, A. A. Sprague, A. C. McClurg, James W. Scott, Geo. F. Bissell, John R. Walsh, Chas. Fitzsimmons, John A. Roche, E. B. McCagg, Owen F. Aldis, Ferdinand W. Peck, James H. Dole, Joseph Stockton, Edward B. Butler, John McConnell, R. A. Waller, H. C. Chatfield-Taylor, A. Crawford, Wm. Sooy Smith, P. S. Peterson, John C. Black, Jno. J. Mitchell, C. F. Gunther, George R. Davis, Stephen A. Forbes, Robert W. Patterson, Jr., M. C. Bullock, Edwin Walker, George M. Pullman, William E. Curtis, James W. Ellsworth, William E. Hale, Wm. T. Baker, Martin A. Ryerson, Huntington W. Jackson, N. B. Ream, Norman Williams, Melville E. Stone, Bryan Lathrop, Eliphalet W. Blatchford, Philip D. Armour.

STATE OF ILLINOIS }
COOK COUNTY } ss.

I, G. R. MITCHELL, a NOTARY PUBLIC in and for said County, do hereby certify that the foregoing petitioners personally appeared before me and acknowledged severally that they signed the foregoing petition as their free and voluntary act for the uses and purposes therein set forth.

Given under my hand and notarial seal this 14th day of September, 1893.

G. R. MITCHELL,
[SEAL] NOTARY PUBLIC, COOK COUNTY, ILL.

CHANGE OF NAME

Pursuant to a resolution passed at a meeting of the corporate members held the 25th day of June, 1894, the name of the COLUMBIAN MUSEUM was changed to FIELD COLUMBIAN MUSEUM. A certificate to this effect was filed June 26, 1894, in the office of the Secretary of State for Illinois.

CHANGE OF NAME

Pursuant to a resolution passed at a meeting of the corporate members held the 8th day of November, 1905, the name of the FIELD COLUMBIAN MUSEUM was changed to FIELD MUSEUM OF NATURAL HISTORY. A certificate to this effect was filed November 10, 1905, in the office of the Secretary of State for Illinois.

CHANGE IN ARTICLE 3

Pursuant to a resolution passed at a meeting of the corporate members held the 10th day of May, 1920, the management of FIELD MUSEUM OF NATURAL HISTORY shall be invested in a Board of TWENTY-ONE (21) TRUSTEES, who shall be elected in such manner and for such time and term of office as may be provided for by the By-Laws. A certificate to this effect was filed May 21, 1920, in the office of the Secretary of State for Illinois.

AMENDED BY-LAWS

DECEMBER 31, 1931

ARTICLE I

MEMBERS

SECTION 1. Members shall be of twelve classes, Corporate Members, Honorary Members, Patrons, Corresponding Members, Benefactors, Contributors, Life Members, Non-Resident Life Members, Associate Members, Non-Resident Associate Members, Sustaining Members, and Annual Members.

SECTION 2. The Corporate Members shall consist of the persons named in the articles of incorporation, and of such other persons as shall be chosen from time to time by the Board of Trustees at any of its meetings, upon the recommendation of the Executive Committee; provided, that such person named in the articles of incorporation shall, within ninety days from the adoption of these By-Laws, and persons hereafter chosen as Corporate Members shall, within ninety days of their election, pay into the treasury the sum of Twenty Dollars (\$20.00) or more. Corporate Members becoming Life Members, Patrons or Honorary Members shall be exempt from dues. Annual meetings of said Corporate Members shall be held at the same place and on the same day that the annual meeting of the Board of Trustees is held.

SECTION 3. Honorary Members shall be chosen by the Board from among persons who have rendered eminent service to science, and only upon unanimous nomination of the Executive Committee. They shall be exempt from all dues.

SECTION 4. Patrons shall be chosen by the Board upon recommendation of the Executive Committee from among persons who have rendered eminent service to the Museum. They shall be exempt from all dues, and, by virtue of their election as Patrons, shall also be Corporate Members.

SECTION 5. Any person contributing or devising the sum of One Hundred Thousand Dollars (\$100,000.00) in cash, or securities, or property to the funds of the Museum, may be elected a Benefactor of the Museum.

SECTION 6. Corresponding Members shall be chosen by the Board from among scientists or patrons of science residing in foreign countries, who render important service to the Museum. They shall be elected by the Board of Trustees at any of its meetings. They shall be exempt from all dues and shall enjoy all courtesies of the Museum.

SECTION 7. Any person contributing to the Museum One Thousand Dollars (\$1,000.00) or more in cash, securities, or material, may be elected a Contributor of the Museum. Contributors shall be exempt from all dues and shall enjoy all courtesies of the Museum.

SECTION 8. Any person paying into the treasury the sum of Five Hundred Dollars (\$500.00), at any one time, shall, upon the unanimous vote of the Board, become a Life Member. Life Members shall be exempt from all dues, and shall enjoy all the privileges and courtesies of the Museum that are accorded to members of the Board of Trustees. Any person residing fifty miles or more from the city of Chicago, paying into the treasury the sum of One Hundred Dollars (\$100.00) at any one time, shall, upon the unanimous vote of the Board, become a Non-Resident Life Member. Non-Resident Life Members shall be exempt from all dues, and shall enjoy all the privileges and courtesies of the Museum that are accorded to members of the Board of Trustees.

SECTION 9. Any person paying into the treasury of the Museum the sum of One Hundred Dollars (\$100.00), at any one time, shall, upon the unanimous vote of the Board, become an Associate Member. Associate Members shall be exempt from all dues, and shall be entitled to tickets admitting member and members of family, including non-resident home guests; all publications of the Museum, if so desired; reserved seats for all lectures and entertainments under the auspices

of the Museum, provided reservation is requested in advance; and admission of holder of membership and accompanying party to all special exhibits and Museum functions day or evening. Any person residing fifty miles or more from the city of Chicago, paying into the treasury the sum of Fifty Dollars (\$50.00) at any one time, shall, upon the unanimous vote of the Board, become a Non-Resident Associate Member. Non-Resident Associate Members shall be exempt from all dues, and shall enjoy all the privileges and courtesies of the Museum that are accorded to Associate Members.

SECTION 10. Sustaining Members shall consist of such persons as are selected from time to time by the Board of Trustees at any of its meetings, and who shall pay an annual fee of Twenty-five Dollars (\$25.00), payable within thirty days after notice of election and within thirty days after each recurring annual date. This Sustaining Membership entitles the member to free admission for the member and family to the Museum on any day, the Annual Report and such other Museum documents or publications as may be requested in writing. When a Sustaining Member has paid the annual fee of \$25.00 for six years, such member shall be entitled to become an Associate Member.

SECTION 11. Annual Members shall consist of such persons as are selected from time to time by the Board of Trustees at any of its meetings, and who shall pay an annual fee of Ten Dollars (\$10.00), payable within thirty days after each recurring annual date. An Annual Membership shall entitle the member to a card of admission for the member and family during all hours when the Museum is open to the public, and free admission for the member and family to all Museum lectures or entertainments. This membership will also entitle the holder to the courtesies of the membership privileges of every Museum of note in the United States and Canada, so long as the existing system of co-operative interchange of membership tickets shall be maintained, including tickets for any lectures given under the auspices of any of the Museums during a visit to the cities in which the cooperative museums are located.

SECTION 12. All membership fees, excepting Sustaining and Annual, shall hereafter be applied to a permanent Membership Endowment Fund, the interest only of which shall be applied for the use of the Museum as the Board of Trustees may order.

ARTICLE II

BOARD OF TRUSTEES

SECTION 1. The Board of Trustees shall consist of twenty-one members. The respective members of the Board now in office, and those who shall hereafter be elected, shall hold office during life. Vacancies occurring in the Board shall be filled at a regular meeting of the Board, upon the nomination of the Executive Committee made at a preceding regular meeting of the Board, by a majority vote of the members of the Board present.

SECTION 2. Regular meetings of the Board shall be held on the third Monday of each month. Special meetings may be called at any time by the President, and shall be called by the Secretary upon the written request of three Trustees. Five Trustees shall constitute a quorum, except for the election of officers or the adoption of the Annual Budget, when seven Trustees shall be required, but meetings may be adjourned by any less number from day to day, or to a day fixed, previous to the next regular meeting.

SECTION 3. Reasonable written notice, designating the time and place of holding meetings, shall be given by the Secretary.

ARTICLE III

HONORARY TRUSTEES

SECTION 1. As a mark of respect, and in appreciation of services performed for the Institution, those Trustees who by reason of inability, on account of change of residence, or for other cause or from indisposition to serve longer in such capacity shall resign their place upon the Board, may be elected, by a majority of those present at any regular meeting of the Board, an Honorary Trustee for life.

Such Honorary Trustee will receive notice of all meetings of the Board of Trustees, whether regular or special, and will be expected to be present at all such meetings and participate in the deliberations thereof, but an Honorary Trustee shall not have the right to vote.

ARTICLE IV

OFFICERS

SECTION 1. The officers shall be a President, a First Vice-President, a Second Vice-President, a Third Vice-President, a Secretary, an Assistant Secretary and a Treasurer. They shall be chosen by ballot by the Board of Trustees, a majority of those present and voting being necessary to elect. The President, the First Vice-President, the Second Vice-President, and the Third Vice-President shall be chosen from among the members of the Board of Trustees. The meeting for the election of officers shall be held on the third Monday of January of each year, and shall be called the Annual Meeting.

SECTION 2. The officers shall hold office for one year, or until their successors are elected and qualified, but any officer may be removed at any regular meeting of the Board of Trustees by a vote of two-thirds of all the members of the Board. Vacancies in any office may be filled by the Board at any meeting.

SECTION 3. The officers shall perform such duties as ordinarily appertain to their respective offices, and such as shall be prescribed by the By-Laws, or designated from time to time by the Board of Trustees.

ARTICLE V

THE TREASURER

SECTION 1. The Treasurer shall be custodian of the funds of the Corporation except as hereinafter provided. He shall make disbursements only upon warrants drawn by the Director and countersigned by the President. In the absence or inability of the Director, warrants may be signed by the Chairman of the Finance Committee, and in the absence or inability of the President, may be countersigned by one of the Vice-Presidents, or any member of the Finance Committee.

SECTION 2. The securities and muniments of title belonging to the corporation shall be placed in the custody of some Trust Company of Chicago to be designated by the Board of Trustees, which Trust Company shall collect the income and principal of said securities as the same become due, and pay same to the Treasurer, except as hereinafter provided. Said Trust Company shall allow access to and deliver any or all securities or muniments of title to the joint order of the following officers, namely: the President or one of the Vice-Presidents, jointly with the Chairman, or one of the Vice-Chairmen, of the Finance Committee of the Museum.

SECTION 3. The Treasurer shall give bond in such amount, and with such sureties as shall be approved by the Board of Trustees.

SECTION 4. The Harris Trust & Savings Bank of Chicago shall be Custodian of "The N. W. Harris Public School Extension of Field Museum" fund. The bank shall make disbursements only upon warrants drawn by the Director and countersigned by the President. In the absence or inability of the Director, warrants may be signed by the Chairman of the Finance Committee, and in the absence or inability of the President, may be countersigned by one of the Vice-Presidents, or any member of the Finance Committee.

ARTICLE VI

THE DIRECTOR

SECTION 1. The Board of Trustees shall elect a Director of the Museum, who shall remain in office until his successor shall be elected. He shall have immediate charge and supervision of the Museum, and shall control the operations of the Institution, subject to the authority of the Board of Trustees and its Com-

mittees. The Director shall be the official medium of communication between the Board, or its Committees, and the scientific staff and maintenance force.

SECTION 2. There shall be four scientific Departments of the Museum—Anthropology, Botany, Geology and Zoology; each under the charge of a Curator, subject to the authority of the Director. The Curators shall be appointed by the Board upon the recommendation of the Director, and shall serve during the pleasure of the Board. Subordinate staff officers in the scientific Departments shall be appointed and removed by the Director upon the recommendation of the Curators of the respective Departments. The Director shall have authority to employ and remove all other employees of the Museum.

SECTION 3. The Director shall make report to the Board at each regular meeting, recounting the operations of the Museum for the previous month. At the Annual Meeting, the Director shall make an Annual Report, reviewing the work for the previous year, which Annual Report shall be published in pamphlet form for the information of the Trustees and Members, and for free distribution in such number as the Board may direct.

ARTICLE VII

AUDITOR

SECTION 1. The Board shall appoint an Auditor, who shall hold his office during the pleasure of the Board. He shall keep proper books of account, setting forth the financial condition and transactions of the Corporation, and of the Museum, and report thereon at each regular meeting, and at such other times as may be required by the Board. He shall certify to the correctness of all bills rendered for the expenditure of the money of the Corporation.

ARTICLE VIII

COMMITTEES

SECTION 1. There shall be five Committees, as follows: Finance, Building, Auditing, Pension and Executive.

SECTION 2. The Finance Committee shall consist of five members, the Auditing and Pension Committees shall each consist of three members, and the Building Committee shall consist of five members. All members of these four Committees shall be elected by ballot by the Board at the Annual Meeting, and shall hold office for one year, and until their successors are elected and qualified. In electing the members of these Committees, the Board shall designate the Chairman and Vice-Chairman by the order in which the members are named in the respective Committee; the first member named shall be Chairman, the second named the Vice-Chairman, and the third named, Second Vice-Chairman, succession to the Chairmanship being in this order in the event of the absence or disability of the Chairman.

SECTION 3. The Executive Committee shall consist of the President of the Board, the Chairman of the Finance Committee, the Chairman of the Building Committee, the Chairman of the Auditing Committee, the Chairman of the Pension Committee, and three other members of the Board to be elected by ballot at the Annual Meeting.

SECTION 4. Four members shall constitute a quorum of the Executive Committee, and in all standing Committees two members shall constitute a quorum. In the event that, owing to the absence or inability of members, a quorum of the regular elected members cannot be present at any meeting of any Committee, then the Chairman thereof, or his successor, as herein provided, may summon any members of the Board of Trustees to act in place of the absentee.

SECTION 5. The Finance Committee shall have supervision of investing the endowment and other permanent funds of the Corporation, and the care of such real estate as may become its property. It shall have authority to invest, sell, and reinvest funds, subject to the approval of the Board.

SECTION 6. The Building Committee shall have supervision of the construction, reconstruction, and extension of any and all buildings used for Museum purposes.

SECTION 7. The Executive Committee shall be called together from time to time as the Chairman may consider necessary, or as he may be requested to do by three members of the Committee, to act upon such matters affecting the administration of the Museum as cannot await consideration at the Regular Monthly Meetings of the Board of Trustees. It shall, before the beginning of each fiscal year, prepare and submit to the Board an itemized Budget, setting forth the probable receipts from all sources for the ensuing year, and make recommendations as to the expenditures which should be made for routine maintenance and fixed charges. Upon the adoption of the Budget by the Board, the expenditures stated are authorized.

SECTION 8. The Auditing Committee shall have supervision over all accounting and bookkeeping, and full control of the financial records. It shall cause the same, once each year, or oftener, to be examined by an expert individual or firm, and shall transmit the report of such expert individual or firm to the Board at the next ensuing regular meeting after such examination shall have taken place.

SECTION 9. The Pension Committee shall determine by such means and processes as shall be established by the Board of Trustees to whom and in what amount the Pension Fund shall be distributed. These determinations or findings shall be subject to the approval of the Board of Trustees.

SECTION 10. The Chairman of each Committee shall report the acts and proceedings thereof at the next ensuing regular meeting of the Board.

SECTION 11. The President shall be ex-officio a member of all Committees and Chairman of the Executive Committee. Vacancies occurring in any Committee may be filled by ballot at any regular meeting of the Board.

ARTICLE IX

NOMINATING COMMITTEE

SECTION 1. At the November meeting of the Board each year, a Nominating Committee of three shall be chosen by lot. Said Committee shall make nominations for membership of the Finance Committee, the Building Committee, the Auditing Committee, and the Pension Committee, and for three members of the Executive Committee, from among the Trustees, to be submitted at the ensuing December meeting and voted upon at the following Annual Meeting in January.

ARTICLE X

SECTION 1. Whenever the word "Museum" is employed in the By-Laws of the Corporation, it shall be taken to mean the building in which the Museum as an Institution is located and operated, the material exhibited, the material in study collections, or in storage, furniture, fixtures, cases, tools, records, books, and all appurtenances of the Institution and the workings, researches, installations, expenditures, field work, laboratories, library, publications, lecture courses, and all scientific and maintenance activities.

SECTION 2. These By-Laws may be amended at any regular meeting of the Board of Trustees by a two-thirds vote of all the members present, provided the amendment shall have been proposed at a preceding regular meeting.

FOUNDER

*MARSHALL FIELD

BENEFACTORS

Those who have contributed \$100,000 or more to the Museum

*AYER, EDWARD E.	HARRIS, ALBERT W.
BUCKINGHAM, MISS KATE S.	*HARRIS, NORMAN W.
CRANE, CORNELIUS	*HIGINBOTHAM, HARLOW N.
*CRANE, R. T., JR.	KELLEY, WILLIAM V.
FIELD, MRS. E. MARSHALL	*PULLMAN, GEORGE M.
*FIELD, JOSEPH N.	RAYMOND, MRS. ANNA LOUISE
FIELD, MARSHALL	*RAYMOND, JAMES NELSON
FIELD, STANLEY	SIMPSON, JAMES
GRAHAM, ERNEST R.	*STURGES, MRS. MARY D.
*DECEASED	

HONORARY MEMBERS

Those who have rendered eminent service to Science

AYER, MRS. EDWARD E.	LUDWIG, H. R. H. GUSTAF ADOLF, CROWN PRINCE OF SWEDEN
BREASTED, PROFESSOR JAMES H.	MCCORMICK, STANLEY
CHALMERS, WILLIAM J.	RAWSON, FREDERICK H.
CRANE, CHARLES R.	ROOSEVELT, KERMIT
CUTTING, C. SUYDAM	ROOSEVELT, THEODORE
FIELD, MRS. E. MARSHALL	ROSENWALD, JULIUS
FIELD, MARSHALL	RYERSON, MARTIN A.
FIELD, STANLEY	SARGENT, HOMER E.
GRAHAM, ERNEST R.	SIMPSON, JAMES
HARRIS, ALBERT W.	SPRAGUE, ALBERT A.
KELLEY, WILLIAM V.	VERNAY, ARTHUR S.

DECEASED, 1931

CRANE, R. T., JR.

PATRONS

Those who have rendered eminent service to the Museum

ARMOUR, ALLISON V.	KNIGHT, CHARLES R.
BORLAND, MRS. JOHN JAY	KUNZ, GEORGE F.
CHADBOURNE, MRS. EMILY CRANE	LANGDON, PROFESSOR STEPHEN
CHANCELLOR, PHILIP M.	MOORE, MRS. WILLIAM H.
CHERRIE, GEORGE K.	PAYNE, JOHN BARTON
COATS, JOHN	PROBST, EDWARD
COLLINS, ALFRED M.	RAWSON, FREDERICK H.
CONOVER, BOARDMAN	ROOSEVELT, KERMIT
CUMMINGS, MRS. ROBERT F.	ROOSEVELT, THEODORE
CUTTING, C. SUYDAM	
DAY, LEE GARNETT	SARGENT, HOMER E.
ELLSWORTH, DUNCAN S.	SMITH, MRS. GEORGE T.
FIELD, MRS. E. MARSHALL	STRAWN, SILAS H.
FIELD, MRS. STANLEY	VERNAY, ARTHUR S.
INSULL, SAMUEL	WHITE, HAROLD A.
KENNEDY, VERNON SHAW	WHITE, HOWARD J.

DECEASED, 1931

STRONG, WALTER A.

CORRESPONDING MEMBERS

Scientists or patrons of science, residing in foreign countries, who have rendered eminent service to the Museum

BREUIL, ABBÉ HENRI	KEITH, PROFESSOR SIR ARTHUR
DIELS, DR. LUDWIG	LANGDON, PROFESSOR STEPHEN
	SMITH, PROFESSOR GRAFTON ELLIOT

CONTRIBUTORS

*Those who have contributed \$1,000 to \$100,000 to the Museum
in money or materials*

\$75,000 to \$100,000

CHANCELLOR, PHILIP M.

RAWSON, FREDERICK H.

\$50,000 to \$75,000

*KEEP, CHAUNCEY

*ROSENWALD, MRS. AUGUSTA N.
RYERSON, MARTIN A.

\$25,000 to \$50,000

*BLACKSTONE, MRS. TIMOTHY B.

COATS, JOHN

CRANE, CHARLES R.

FIELD, MRS. STANLEY

*JONES, ARTHUR B.

*PORTER, GEORGE F.

ROSENWALD, JULIUS

VERNAY, ARTHUR S.

WHITE, HAROLD A.

\$10,000 to \$25,000

ARMOUR, ALLISON V.

*ARMOUR, P. D.

CHADBOURNE, MRS. EMILY CRANE

CHALMERS, WILLIAM J.

CONOVER, BOARDMAN

*CUMMINGS, R. F.

CUTTING, C. SUYDAM

*EVERARD, R. T.

*GUNSAULUS, DR. F. W.

INSULL, SAMUEL

MCCORMICK, CYRUS (ESTATE)

MCCORMICK, STANLEY

*MITCHELL, JOHN J.

*DECEASED

*REESE, LEWIS

ROBB, MRS. GEORGE W.

ROCKEFELLER FOUNDATION, THE

SMITH, MRS. GEORGE T.

*STRONG, WALTER A.

WRIGLEY, WILLIAM, JR.

\$5,000 to \$10,000

*ADAMS, GEORGE E.

*ADAMS, MILWARD

*BARTLETT, A. C.

BISHOP, HEBER (ESTATE)
BORLAND, MRS. JOHN JAY

*CRANE, R. T.

*DOANE, J. W.

*FULLER, WILLIAM A.

GRAVES, GEORGE COE, II

HARRIS, HAYDEN B.

HARRIS, NORMAN DWIGHT

*HARRIS, MRS. NORMAN W.

*HUTCHINSON, C. L.

*KEITH, EDSON

LANGTRY, J. C.

MACLEAN, MRS. M. HADDON

MOORE, MRS. WILLIAM H.

*PEARSONS, D. K.

*PORTER, H. H.

*REAM, NORMAN B.

*REVELL, ALEXANDER H.

SARGENT, HOMER E.

*SPRAGUE, A. A.

STRAWN, SILAS H.

THORNE, BRUCE

*TREE, LAMBERT

\$1,000 to \$5,000

AMERICAN FRIENDS OF CHINA
AYER, MRS. EDWARD E.

BARRETT, SAMUEL E.
BENSABOTT, R., INC.

*BLAIR, WATSON F.
BORDEN, JOHN

CHALMERS, MRS. WILLIAM J.
CRANE, MRS. R. T., JR.
CUMMINGS, MRS. R. F.

DOERING, O. C.

FIELD, HENRY

GRAVES, HENRY, JR.
GUNSAULUS, MISS HELEN

*HIBBARD, W. G.
HIGGINSON, MRS. CHARLES M.
*HILL, JAMES J.
*HIXON, FRANK P.
HUGHES, THOMAS S.

*JACKSON, HUNTINGTON W.
JAMES, S. L.

*DECEASED

LEE LING YÜN

*MANIERRE, GEORGE
*MARTIN, ALFRED T.
McCORMICK, CYRUS H.
McCORMICK, MRS. CYRUS

*OGDEN, MRS. FRANCES E.

PALMER, POTTER
PATTEN, HENRY J.

RAUCHFUSS, CHARLES F.
RAYMOND, CHARLES E.
REYNOLDS, EARLE H.
RYERSON, MRS. MARTIN A.

SCHWAB, MARTIN C.
SCHWEPPE, MRS. CHARLES H.
SHAW, WILLIAM W.

*SMITH, BYRON L.
SPRAGUE, ALBERT A.

THOMPSON, E. H.
THORNE, MRS. LOUISE E.

VANVALZAH, DR. ROBERT
*VONFRANTZIUS, FRITZ

WILLIS, L. M.

CORPORATE MEMBERS

ARMOUR, ALLISON V.

BORDEN, JOHN

BORLAND, MRS. JOHN JAY

BYRAM, HARRY E.

CHADBOURNE, MRS. EMILY CRANE

CHALMERS, WILLIAM J.

CHATFIELD-TAYLOR, H. C.

CHERRIE, GEORGE K.

COATS, JOHN

COLLINS, ALFRED M.

CONOVER, BOARDMAN

CUMMINGS, MRS. ROBERT F.

CUTTING, C. SUYDAM

DAY, LEE GARNETT

ELLSWORTH, DUNCAN S.

FIELD, MRS. E. MARSHALL

FIELD, MARSHALL

FIELD, STANLEY

FIELD, MRS. STANLEY

GRAHAM, ERNEST R.

HARRIS, ALBERT W.

INSULL, SAMUEL

KELLEY, WILLIAM V.

KENNEDY, VERNON SHAW

KNIGHT, CHARLES R.

KUNZ, GEORGE F.

LANGDON, PROFESSOR STEPHEN

MCCORMICK, CYRUS H.

MITCHELL, WILLIAM H.

MOORE, MRS. WILLIAM H.

PAYNE, JOHN BARTON

PROBST, EDWARD

RAWSON, FREDERICK H.

RICHARDSON, GEORGE A.

ROOSEVELT, KERMIT

ROOSEVELT, THEODORE

RYERSON, MARTIN A.

SARGENT, HOMER E.

SIMMS, STEPHEN C.

SIMPSON, JAMES

SMITH, MRS. GEORGE T.

SMITH, SOLOMON A.

SPRAGUE, ALBERT A.

STRAWN, SILAS H.

VERNAY, ARTHUR S.

WHITE, HAROLD A.

WHITE, HOWARD J.

WRIGLEY, WILLIAM, JR.

DECEASED, 1931

CRANE, R. T., JR.

STRONG, WALTER A.

LIFE MEMBERS

Those who have contributed \$500 to the Museum

ABBOTT, JOHN JAY	CARPENTER, AUGUSTUS A.
ABBOTT, ROBERT S.	CARPENTER, MRS. HUBBARD
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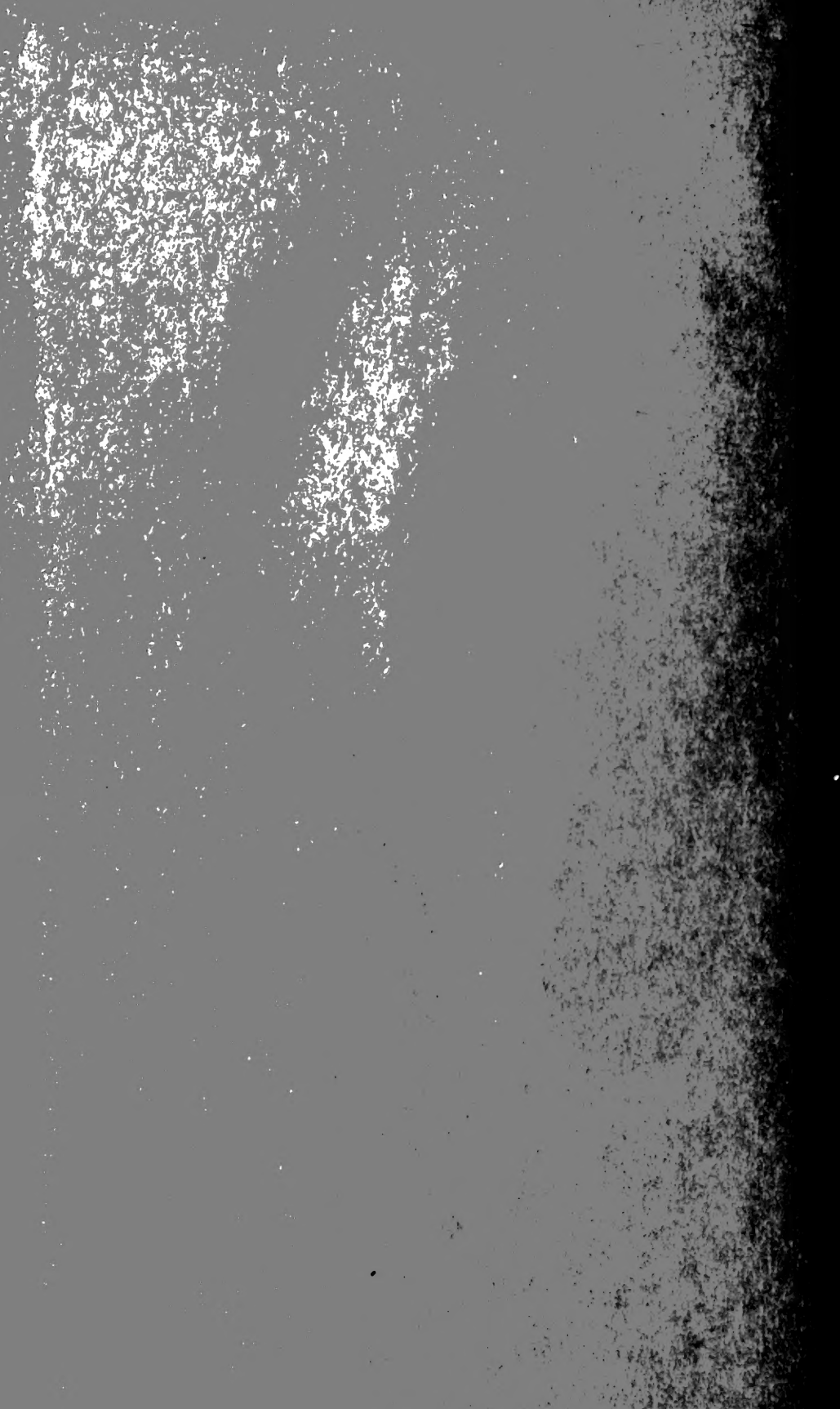
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